Specifications of Waukesha Gasoline-Powered Household Refrigerator

Waukesha Motor Co., Waukesha Wis.

Cabinet—Seeger 1-door cabinet for model 704. Waukesha 1-door cabinet for Cold Chest model. Steel frames, Bakelite breaker strips, rubber gasket. Celotex insulation. Thickness in model 704: top, sides, back, and door: 3 in.; bottom 4 in. Thickness in Cold Chest: top and door, 2 in.; back and bottom, 4 in.; sides, 3 in. Chromium plated hardware.

Compressor—Waukesha open-type reciprocating compressor, direct driven. Bellows shaft seal. Compressor speed 625 r.p.m. Bore, 1.5; stroke, 1.5. Compressor below food compartment. Refrigerant charge, 2 lbs. Lubricant charge, 1 pt.

Control—Waukesha manually operated time control.

Motor—Gasoline engine.

Evaporator—Waukesha brass evaporator, brine chamber type. Detroit Lubricator thermostatic expansion valve. Aluminum ice cube trays.

Condenser—Modine fan-cooled fin tube condenser.

MODEL NO.	CU. FT.	INSTALLED PRICE	I.M.E. LBS.	MOTOR HP.	REFRIG-ERANT	NET WEIGHT	FINISH: D—DULUX, P—PORCELAIN, L—LACQUER EXTERIOR—CABINET	DIMENSIONS—INTERIOR	SHELVES SQ. FT.	NO. OF SHELVES	ICE TRAYS	NO. OF CUBES	WEIGHT IN LBS.
704	7.3	$.....	250	3/4	CH_3Cl	140	D 58¾ x 34⅝ x 27⅝	P 31½ x 16¾ x 27½	14.3	4	2	84	6¾
Cold Chest	3.16	.....	250	3/4	CH_3Cl	140	D 40 x 28½ x 29½	P 12 x 24 x 17¾	4.8	2	1	28	2¼

Macy & Co. Acquires G-E Flatop Rights

(*Concluded from Page 1, Column 3*)

wrecking of the market for their products.

Other department stores have the satisfaction of knowing that they can go ahead and sell refrigerators at a profit, without the annoyance of seeing Macy's advertise at lower prices lines the others are selling.

Macy's gains by acquiring the exclusive franchise for one of the leading nationally advertised electric refrigerators (the General Electric Flatop has basically the same hermetically sealed mechanism as the better known G-E Monitor Top).

General Electric gets a new customer for its Flatop line, which has not had quantity distribution in the New York metropolitan area previously. In this connection, it should be noted that *for the first time* Macy's store agrees to sell on time payments.

Should a customer for a G-E Flatop not want to pay spot cash in full in order to get the 6 per cent discount, he can pay the regular price and obtain the refrigerator on terms offered by the General Electric Contracts Corp. Deferred payment sales of this type made by Macy's will be arranged through Rex Cole, Inc., the G-E distributor in New York City.

Other New York City department stores will handle the General Electric Monitor Top line of electric refrigerators, but agree not to try to compete with Macy's prices on the Flatop line (which has comparatively lower list prices than the Monitor Top models, besides Macy's 6 per cent discount for cash).

Sanitary Electric Corp's Broadside Gives Data On 8 Models

FOND DU LAC, Wis.—New broadside issued by Sanitary Electric Corp., lists features and key specifications of six models of electric refrigerators and two models of condensing units.

Models listed, pictured, and described are models 522, 870, 700, 22-B, 310, and 420. Condensing units are BACU and DACU.

Some of the features listed are a usable top, modern hardware, balloon rubber door gaskets, indirect lighting, swinging shelves, tray release, chiller door, flexotray, removable crisper, and dairy basket.

WARNING!

Beware of fake subscription agents, claiming to represent this publication. Reports have been received from numerous cities, particularly in the Middle West, regarding glib-tongued strangers offering greatly reduced rates on subscriptions to ELECTRIC REFRIGERATION NEWS and to the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

ELECTRIC REFRIGERATION NEWS employs no subscription agents or solicitors. The names of all traveling members of the staff appear in the mast-head above the editorial column in each issue of the paper.

Several dealers who have been defrauded, state that these fake agents appear to be very familiar with the publication, their editorial policies and services to the industry.

Some of these men have issued official-looking receipts of subscription agencies in Kansas City and Chicago but such receipts have been repudiated by the agencies. In one instance, an established agency has disclaimed all responsibility for its serially-numbered, "bonded" receipts.

We have also been furnished with evidence consisting of cancelled checks which were made payable to ELECTRIC REFRIGERATION NEWS and cashed by local merchants on forged endorsements.

It appears that these fake agents are capitalizing upon the fact that ELECTRIC REFRIGERATION NEWS is "easy to sell" and that electric refrigeration men are busy and prosperous.

Through the cooperation of an alert public utility man, in Illinois, we have just recently picked up the trail of one of these men and the indications are that it will be just a matter of time until his arrest is effected.

Readers are requested to wire immediately if any stranger appears in the community soliciting subscriptions and claiming to represent this publication for some unknown magazine agency.

Attorneys for the NEWS will take prompt action whatever and wherever one of these imposters is apprehended.

Louisville Exposition Will Open April 22

LOUISVILLE—The Louisville Exposition, which will feature exhibits by refrigeration and other electrical appliances and homewares dealers, will be held in the Jefferson County Armory here April 22 to 30.

Southern Distributors Maintain Fast Pace As Leaders in G-E Contest are Named

CLEVELAND — General Electric distributors in the south continue to do the outstanding sales job in "Refrigerania Sweepstakes," G-E spring sales campaign, reports Jean DeJen, national campaign manager. Southern G-E distributors who now are almost half way through the nine-weeks' spring campaign, are expected to reach their contest quota within the next week or two.

Leaders in the campaign to date (the country being divided into 11 sales groups) are as follows:

Group 1—Matthews Electric Supply Co., Birmingham, Ala.

Group 2—Perry-Browne, Inc., Columbia, S. C.

Group 3—Southern Appliances, Inc., New Orleans.

Group 4—General Electric Supply Corp., Portland, Ore.

Group 5—Electric Appliances, Inc., Indianapolis.

Group 6—A. Wayne Merriam, Inc., Schenectady, N. Y.

Group 7—E. Pulver Cook, Inc., Providence, R. I.

Group 8—Rex Cole, Inc., New York City.

Group 9—James & Co., Inc., St. Louis.

Group 10—Dakota Electric Supply Co., Fargo, N. D.

Group 11—General Electric Supply Corp., Salt Lake City.

"If each of the four distributors in group 1 were in any other group they would be leaders this week," DeJen declared, as he figured reports from all over the country.

"Another striking thing about the reports is the way sales are going in the midwest where they have had droughts and dust storms.

"Commercial refrigeration sales are leading in point of sales to quota, with domestic refrigeration second. The campaign, of course, takes in all appliances — refrigerators, ranges, dishwashers, cleaners, washers, and so forth, with winners to be decided as to the balanced sales job they do.

Berman Furniture Named G-E Dealer in Oakland

OAKLAND, Calif.—Berman Furniture Co. here was recently appointed as downtown dealer for General Electric refrigerators. Sam Berman is the firm's general manager. John Wasson is manager of the new department.

S-W Sales & Profits Up For Just 2 Months

CHICAGO—Sales of Stewart-Warner Corp. for the first three months of 1935 were 30 per cent larger than those made in the corresponding period of 1934, James S. Knowlson, chairman of the board, reported at the recent annual stockholders meeting.

Net profits for January and February, after taxes and depreciation, were $200,000, as against profits of $32,000 made during these months in 1934.

At this meeting, T. R. Sullivan of Chicago, secretary-treasurer of the corporation, was elected to the board of directors to succeed Robert J. Graham, who died recently.

C. R. Logan Addresses Washington Engineers

WASHINGTON, D. C.—C. R. Logan, commercial supervisor in Philadelphia for York Ice Machinery Corp., and chairman of the Philadelphia section of the American Society of Refrigeration Engineers, recently addressed members of the Washington Society of Engineers at the Cosmos Club here.

Mr. Logan's subject was "Domestic and Foreign Commercial Refrigeration."

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EXTRA DRY ESOTOO
VIRGINIA SMELTING

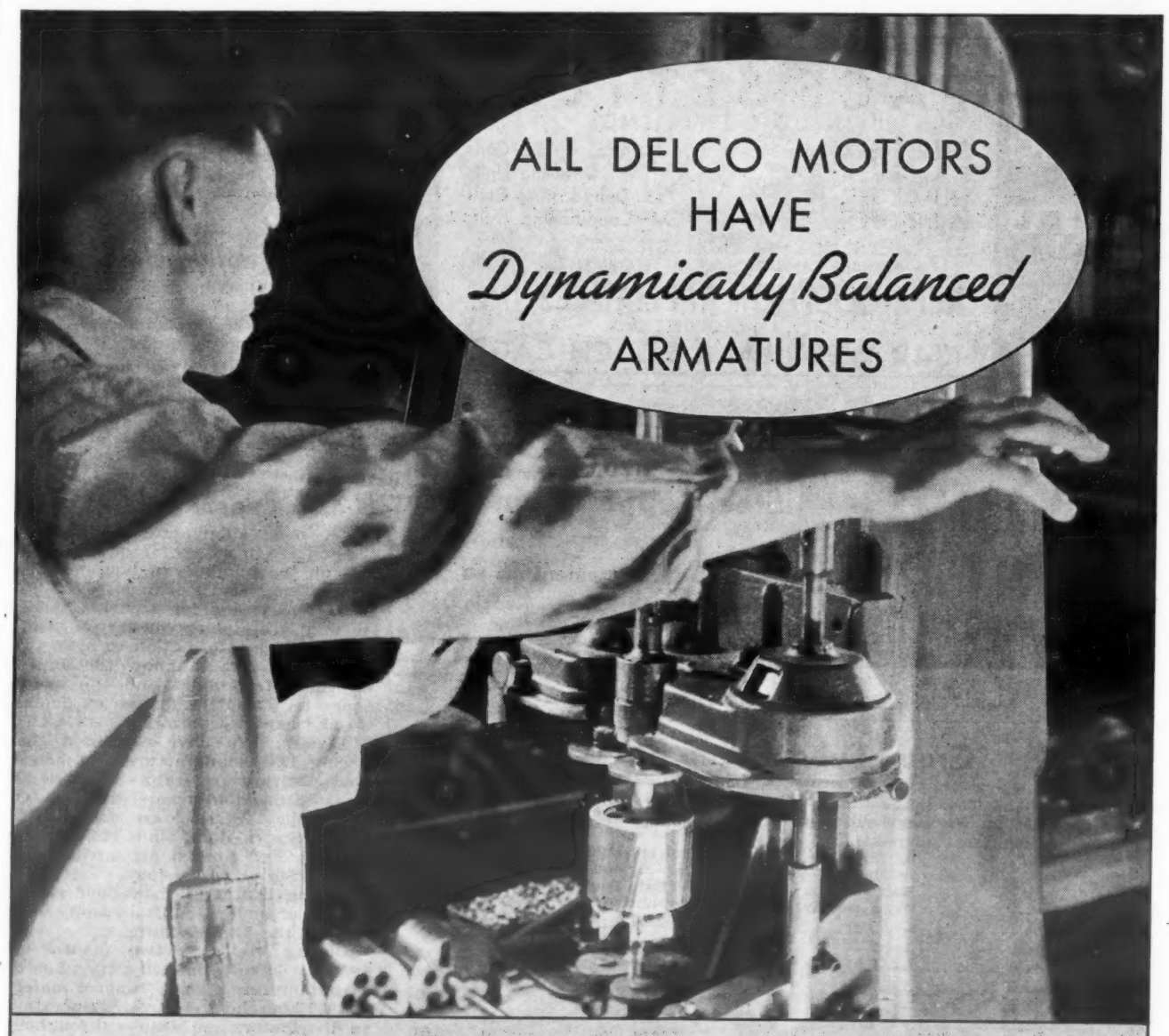
(Liquid Sulphur Dioxide)

. . . because they can always rely on its unvarying purity and dryness—and because they can get it quickly from 49 conveniently located distribution points. They use V-METH-L, too; for Air-Conditioning, Ice Cream Cabinets. If at any time you have a refrigeration problem that seems to baffle even your skill, let us help you in its solution. Just write to our Advisory Department, stating the facts—and see how quickly you'll receive the answer! This service involves neither cost nor obligation on your part—may save you time and money.

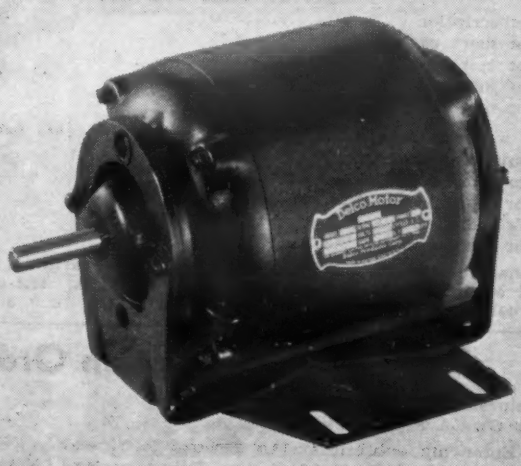
VIRGINIA SMELTING CO.
WEST NORFOLK, VIRGINIA

MAIL THIS COUPON Now

F. A. Eustis, Sec'y, Virginia Smelting Co., 131 State St., Boston, Mass.
Send me the literature I have checked. I am interested in receiving any additional literature on Electrical Refrigeration you may issue from time to time.
☐ Folder: Extra Dry ESOTOO (Liquid Sulphur Dioxide) ERN-4-17-35
☐ Folder: V-METH-L (Virginia Methyl Chloride)
☐ Folder: Transferring from large to small cylinders
☐ Circular: Physical properties of various refrigerants
Name .....
Street & No. .....
City & State .....



To insure the quiet operation so essential in an electric appliance, rotating parts must be absolutely free from vibration, which means they must be in perfect running or "dynamic" balance, as well as in static balance. In Delco motors, dynamic balance is assured by testing armatures on a special machine. This special machine, developed by Delco engineers after many years of research and experiment, quickly and accurately checks the balance of every Delco motor armature at running speed. As a result, Delco motors run without vibration and without noise—a fact which explains why Delco motors are so widely used on motor driven appliances.



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DELCO MOTORS

THE NEWSPAPER OF THE INDUSTRY

ELECTRIC REFRIGERATION NEWS

WRITTEN TO BE READ ON ARRIVAL

Registered U. S. Patent Office

ESTABLISHED 1926. MEMBER AUDIT BUREAU OF CIRCULATIONS. MEMBER ASSOCIATED BUSINESS PAPERS. MEMBER PERIODICAL PUBLISHERS INSTITUTE

VOL. 14, NO. 17, SERIAL NO. 318
ISSUED EVERY WEEK

Entered as second-class matter Aug. 1, 1927

DETROIT, MICHIGAN, APRIL 24, 1935

THREE DOLLARS PER YEAR
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G-E Introduces 8 Machines for Summer Cooling

Freon Units Ranging from 1.8 to 21.5 Tons Capacity Uses New Receiver

SCHENECTADY—Eight new Freon condensing units of from 1½ to 20 hp. and rated at from 1.8 to 21.5 tons refrigerating capacity, have just been announced by the air-conditioning department of the General Electric Co.

These new units are additions to the present G-E line; three of them, types CM-61S, CM-81W, and CM-81S being equipped with water-cooled, double-tube counterflow condensers, and the others, type CM-81L, two types CM-9L, and two types CM-10L, having new shell-and-tube condenser-receivers.

All of the new units have external motors with multiple v-belt drive to the compressors, liquid refrigerant filters, suction pressure controls, high-pressure safety cutouts, water regulating valves, service valves, and water and refrigerant connections.

Units are shipped with a full charge of lubricating oil and a holding charge of Freon refrigerant. Included with each unit is a magnetic motor starting switch and a thermal overload protective device for the motor.

Types CM-61S, CM-81W, and CM-81S, 1½ hp., 3 hp., and 5 hp., respec-

(*Concluded on Page 12, Column 3*)

Committees Named By Detroit A.S.R.E.

DETROIT—Convention committee chairmen of the Detroit Section, American Society of Refrigerating Engineers, which will be host to the annual spring meeting of the A.S.R.E. here May 22 through 24, met Monday night to formulate plans for the entertainment of industry engineers during their visit to Detroit.

On Wednesday evening, May 22, the engineers and their wives will be entertained by ELECTRIC REFRIGERATION NEWS at a "Refrigeration Fiesta" at 5229 Cass Ave. Dinner will be served at 7 o'clock, to be followed by dancing and professional entertainment throughout the evening.

The committees, as announced by Prof. Hugh E. Keeler of the University of Michigan, chairman of the local section, are as follows:

Hospitality (registration): Dan D. Wile (chairman), F. B. Riley (vice chairman), R. M. Hyde, R. M. Jamison, John Klabon, C. M. Lee, H. J. Scullen, C. L. Toonder.

Program: Hugh E. Keeler (chairman), Chas. Thomas (vice chairman), Edward Heitman, P. M. Johnson, G. R. Kingston, A. E. Knapp, J. E. Naegely, L. A. Philipp, W. A. Wagstaff.

Transportation: A. D. McLay (chairman), D. P. Heath (vice chairman), J. C. Buchanan, R. W. Doeg, W. C. DuComb, S. J. Harry, R. M. Martin, E. M. May.

Entertainment: F. M. Cockrell (chairman), John Wyllie, Jr. (vice chairman), A. D. Althouse, M. N. Austin, P. W. Baker, E. J. Baluff, G. L. Ohmart, T. A. Ollila.

Recreation: I. J. Knudson (chairman), Emmet J. Mueller (vice chairman), Edward Barger, G. W. Mason, I. H. Reindel, G. F. Taubeneck, R. L. Wells.

Dinner and Luncheon: Frank West (chairman), Matson C. Terry (vice chairman), W. G. Nagel, T. H. Nutter, J. M. Oberc, B. L. Quarnstrom, B. E. Tiffany, W. H. Jacques.

Ladies: Elizabeth Bright (chairman), Mrs. Hugh Keeler (vice chairman), Mrs. Dan Wile, Mrs. F. M. Cockrell, Mrs. Emmett Mueller, Mrs. Dan Ellis.

T. K. Quinn Will Speak On FHA Broadcast

CLEVELAND—T. K. Quinn, vice president of the General Electric Co., will speak over a nation-wide radio hook-up Sunday, April 28, on the subject of "What Home Means to Me."

The broadcast will be a part of the 26-week radio program sponsored by the Federal Housing Administration. The time is 12:15 o'clock (E.S.T.) Sunday afternoon.

74 Conditioners Sold during 1934 in Baltimore, 62 in Washington

BALTIMORE—Installations of air-conditioning equipment in this city and neighboring Washington, D. C., showed important gains during 1934. The 74 installations reported in Baltimore exceeded by one the total made in all years before 1934, while the Capital's total of 62 installations was only 17 short of the number recorded in all years previous.

The figures for Washington, however, do not take into account the several installations made last year in Federal and District government buildings.

Most notable gain in Baltimore, in point of number of installations, was in food stores of the city. Where prior to 1934 no installations were reported in places of this type, last year saw five systems, with a total of 20 hp., put into use.

Department stores and specialty apparel shops were among other important users of air-conditioning equipment last year. Six department store installations, totaling 723 hp., were reported, against but one in all previous years; and nine systems with a total of 109 hp. were installed in specialty apparel shops, where but three had been in use before.

Residential installations held up well, the six 1934 installations comparing favorably with the total of eight made before that time. The same was true in the office field, where 13 systems were installed in 1934, equaling the number already in use at the start of the year. Size of the systems in this group, however, showed an increase from 57 connected hp. for the 13 put in use before last year to 163 hp. for the 1934 installations.

Twelve theaters in Baltimore installed comfort cooling systems, but the total of 612 hp. was considerably under the 1,764 hp. of the 10 systems reported in use before 1934. One of the theaters equipped during 1934 was destroyed by fire. The system in use there totaled 18 hp.

Adaptation of air-conditioning equipment to restaurant use kept pace with figures for previous years, eight systems, totaling 116 hp., being installed during 1934, compared with 10 systems of 194 total hp. in years before that time.

In the barber shop-beauty parlor field, three installations were reported, totaling 37 hp., while four confectioneries and drug stores installed systems with a total of 80 hp. Systems totaling 47 hp. were also installed in two of the city's hospitals.

Industrial applications, however, were at a standstill during the year, no installations having been added to the nine systems totaling 494 hp. in use before 1934. So, also, were air-conditioning activities in banks and brokerage houses, in which eight systems, with 478 total hp., were in use at the start of last year.

Chief increase in the installations reported in Washington, D. C., was in the store field—21 installations, totaling 500 hp., being far ahead of the figures reported at the start of the year—eight systems of 360¾ hp.

Office installations also registered a nice increase for the year, the 10 systems put in use last year topping by three the total number in service prior to that time.

Largest single installation made during the year was in a new office building, in which a complete air-conditioning system was installed, totaling 422½ hp. The city now has three big office buildings completely conditioned, since two, with equipment totaling 660 hp., were already in use at the beginning of the year.

In the hotel field, use of air conditioning registered a notable gain after a rather inactive 1933. Six hotel dining rooms and coffee shops were fitted with systems totaling 204½ hp. last year, raising the city's total in this classification to 10. One of the larger hotels also conditioned its sleeping rooms for the comfort of its guests during the summer months with a system employing 51 hp.

Restaurants not connected with hotels also increased their use of air-conditioning equipment during the year, 10 of them reporting installations totaling 360 hp., to bring the

(*Concluded on Page 12, Column 5*)

St. Louis Distributing Firm Will Handle Conservador

ST. LOUIS — Electric Lamp & Supply Co., 1900 Washington Ave., has been appointed distributor of Fairbanks-Morse electric refrigerators in metropolitan St. Louis and adjacent trade territory.

The franchise does not include the Fairbanks-Morse line of radios. Herman Hollender is head of the distributorship, which also handles Electrolux refrigerators and Zenith radios.

Crosley Production Near 2,000 Units Daily

CINCINNATI—Production of Crosley household electric refrigerators is now averaging between 1,800 and 2,000 units daily, Lewis M. Crosley, vice president and general manager, announced last week.

Number of employees has been increased to 4,270, largest company payroll in the history of the firm, according to Mr. Crosley.

Shipments of Crosley refrigerators to distributors during the month of March were 41 per cent greater than those for the same month a year ago, Mr. Crosley stated.

Boston Branch Appoints 14 Kelvinator Dealers

CAMBRIDGE, Mass.—Fourteen new Kelvinator dealers were recently appointed by Harry Troutwine, manager of the Kelvinator branch here. The newly appointed retailers include:

Fred W. Davis, Melrose; F. J. Leone, Lawrence; Brooks Sales Co., Boston; Robert E. Walters, Newburyport; Allen Furniture Co., Dorchester; C. C. Peter Co., Boston; Town Square Hardware Supply Co., Norwood; M. L. Alpert Co., Jamaica Plain; Stuart Radio Corp., Boston; Vernon W. Jones, Winchester; Gorfinkle Furniture Co., Dorchester; Dykeman Brothers, Hingham; J. S. Kinsman, Framingham; and Appliance Service Co., Auburn.

G-E Backs Plan to Build Model Homes

SCHENECTADY—A housing program, designed to produce one new house for each 100,000 of population throughout the country by Sept. 1, 1935, has been launched by the General Electric Co. with the announcement of its home building program.

The general plan is to offer selected builders new ideas, prize-winning drawings, substantial discounts and terms on electrical equipment, and national advertising and support, all in consideration of the construction by these builders of demonstration style houses.

J. F. Quinlan, who was in charge of the architectural competition, will head up the new organization for the building program, with headquarters in New York.

The General Electric Co. will be represented in the larger communities by district committees composed of specialty appliance, merchandise, and air-conditioning distributors, working with the company's district office managers and field representatives of the various departments.

In communities where there are no major distributors representing the company, local committees of dealers are to be organized.

The plan will be presented by the committees to the local utility companies for their support, and each committee will select builders in order that construction may start as soon after May 1 as possible.

The company is already assured of the cooperation of the Federal Housing Administration and of numerous builders, publishers, and banks which are anxious to help, it was declared. The houses are to be opened this fall to the public during the months of September and October.

An outgrowth of the recent General Electric architectural competition, in which more than 9,000 architects submitted some 2,000 sets of drawings, the program will be carried out through committees formed in the various sections of the country during this month. The jury in the competition selected 52 prize-winning drawings which indicated that architects

(*Concluded on Page 2, Column 1*)

With Larkin

CARL J. CONKEY

• • •

Conkey Heads Larkin Sales in Midwest

ATLANTA—Carl J. Conkey, formerly commercial sales manager of Servel Sales, Inc., has been appointed sales manager of the central states division of the Larkin Refrigerating Corp., Lester U. Larkin, vice president and general manager of the Larkin organization reports.

Mr. Conkey has been in the refrigeration industry since 1927, and spent six years in the commercial sales department of Servel Sales, Inc., at Evansville, as district representative and commercial department sales manager.

Birmingham Utility Sells Liftops

BIRMINGHAM, Ala.—The Birmingham Electric Co., which at the beginning of the season withdrew from the electric refrigeration field, is now selling General Electric TVA "Liftop" models.

The company plans to reach the low-income customers who probably would not otherwise buy a more conventional box. The midget refrigerator will be sold for $85.59 cash or $99.70 on terms of $4.50 down and $3.00 a month.

"In making a study of our customers, we found that 25,000 of them, or about one-half, use less than 25 kwh. of current," said D. S. Richard, sales manager. "Their light bills run less than $1.50 a month, making them 'losing' customers to us. Therefore, we intend with the Liftops to build up the current consumption with this 50 per cent of our customers.

"The refrigerators will be placed on demonstration for as long as five days and, frankly, if one-third of the sales stick we will be satisfied. We feel that once tasting the convenience of a refrigerator, these customers will never be without one, whether they keep the Liftops or buy a more conventional model."

The utility has discontinued the practice of displaying various makes of refrigerators on its sales floor for the benefit of the dealers, at the suggestion of the Birmingham Electric Refrigeration Bureau. Charges of favoritism arose despite efforts to be impartial.

Rex Cole Moves Offices To Long Island City

NEW YORK CITY—On completion of alterations, Rex Cole, Inc., General Electric home appliance distributor, will move its entire headquarters to the building in Long Island City, heretofore used for the service and delivery departments only, reports Rex Cole, president of the organization.

"Under the new plan," says Mr. Cole, "administration, operating, advertising, and sales departments will also be quartered in the Hunters Point Ave. building."

Closer interdepartmental relationship and operating economies are the objectives of the new arrangement. The organization will continue the display room in the General Electric building here.

'Winter Selling' Plan Attacked By Credit Men

Conference Also Hits Coin Meter Plan Of Selling

CHICAGO — Recommending that "the 'winter selling' and similar plans for electric refrigerators be kept within the schedule of recommended standard terms" the National Association of Sales Finance Companies met here recently to draw up a set of standard terms designed to discourage the sale of refrigerators on "winter selling" and like plans.

Terms formulated at the meeting have since been adopted by the National Association of Sales Finance Companies as the standard time sales terms of that organization, according to L. S. Crowder of the National Retail Credit Association.

"While the meter plan of selling refrigerators was criticized," he asserted, "it was brought out that the plan originated in one of the large department stores. It was felt that for the time being no attempt should be made to have it discontinued."

It was stated that credit rejections, under the meter and no down payment plan, to be sound, should be between 30 and 40 per cent, which, if true, in the opinion of Mr. Crowder, outlaws the plan. No successful retailer, he believes, can afford such a high percentage of rejections.

The following standard terms were recommended:

	Down Payment Per Cent	Time Months
Refrigerators, Domestic	10	24
Commercial	20	24
Apartment House	10	36
Washing Machines & Ironers	10	15
Radios	10	12
Vacuum Cleaners	10	12
Stokers, Domestic	10	24
Commercial	20	24
Oil Burners	10	24
Oil Burning Furnaces	10	24
Heating Equipment	10	24
Furniture and Furnishings:		
Up to $ 50	10	8
50—150	10	10
150—200	10	12
200—250	10	15
Over 250	10	18

Minimum down payment and minimum monthly payment, all classes of merchandise, $4.50.

The following associations and companies were represented:

National Association of Sales Finance Companies, Chicago; General Motors Acceptance Corp., New York; Domestic Finance Co., Kansas City; Bankers Commercial Corp., Chicago; Devonshire Financial Service Corp., Boston; General Electric Contracts Corp., New York; Minneapolis Securities Corp., Minneapolis; C.I.T. Corp., Chicago; Reserve Discount Corp., St. Louis; Illinois Retail Hardware Association, Indianapolis; National Electric Manufacturers Association, New

(*Concluded on Page 2, Column 5*)

Frigidaire Changes Setup in Hartford

HARTFORD, Conn.—Bauer & Co., Inc., has taken over the Frigidaire sales and service business formerly conducted here as a factory branch. In addition to the Frigidaire line of refrigeration equipment, the company handles Hotpoint, Universal, and Standard electric appliances.

T. C. Grant is sales manager and W. E. Quimby, service manager. The apartment house division is headed by W. A. Mauser, and the household range and appliance department is in charge of W. H. Sneyd, formerly connected with the Hartford Electric Light Co.

Lima Metal Products Elects New Officers

LIMA, Ohio—H. F. Roush was elected president of the Lima Metal Products, Inc., manufacturer of refrigerator cabinets, in a recent change in personnel.

Other officers elected were J. E. Morris, vice president; F. L. Kelly, treasurer and general manager; Morris Hughes, secretary; H. M. Chenoweth, assistant secretary; H. M. Scarff, factory manager.

G-E Backs Plan to Build Model Homes

(*Concluded from Page 1, Column 2*)

the country over have discarded many old conceptions and that during the lull in building the invention and use of new equipment and materials has continued.

A selection of the prize-winning plans will be made available to the builders, including working drawings.

Upon their completion, these "New American" style houses will be featured by General Electric in national and local advertising, and representatives of the company will cooperate.

Credit will be extended by the company to electrical dealers and distributors to cover the sale of the basic electrical equipment involved.

"The public is receptive," Vice President T. K. Quinn of the General Electric Co., declared in announcing the new plan. "There is a surprising undercurrent of curiosity and interest in housing. People want to be 'sold.' They can only be sold by actually showing and demonstrating the latest and best in houses and doing it in such a way as to spread confidence and create a demand for them. The new houses will establish new standards and the modernization of old homes will naturally follow on a large scale.

"The public and its interpreters and specialists are now thinking in terms of designing houses from the inside out. They no longer begin with a fixed external picture which carries with it the connotation of a required internal plan.

"The 'New American' plan requires an approach from the point of view of providing an organization of space for the living of a typical family. It contemplates the coordination of indoor and outdoor living. It is simple in design and emphasizes livability in every possible respect."

Meter-Ator Sales Plan Gains Popularity In South Africa

JOHANNESBURG, South Africa—S. T. Richards, head of Geen & Richards, Kelvinator distributor for the Transvaal territory, recently inaugurated the first large Meter-Ator campaign to be undertaken abroad. Result of the project was three immediate orders—one for 150 meters and two others totaling 350 Kelvinators.

Sent to Detroit as his city's delegate to the Rotary Club convention, Mr. Richards spent a week while here at the Detroit Kelvinator plant studying sales plans adaptable to his territory.

Before returning to Africa, Mr. Richards also visited the World's Fair and the Canadian and English Kelvinator plants.

70 Dealers at Kelvinator Oil Burner Meeting

BOSTON—Approximately 70 dealers for Kelvinator oil burners attended a recent meeting here conducted by G. H. Rittenhouse, manager of the Boston automatic heating division.

Mr. Rittenhouse explained the newspaper, direct mail, sales promotion, and radio programs that Kelvinator Corp. now has available for use in the spring drive. He pointed out that waiting for parts shipments could be eliminated by dealing direct with a factory branch instead of with the main factory.

C. M. Attmore, credit manager, explained the facilities of the Refrigeration Discount Corp.

L. C. Bickford, WNAC's editor of "News While It Is News," discussed markets reached by the radio, and urged dealers to tie in with Kelvinator's radio program.

10 Makes Displayed At San Antonio's Spring Show

SAN ANTONIO, Tex.—Ten makes of 1935 refrigerator models were exhibited at the Spring Refrigeration Show held here recently by local distributors, dealers, and the San Antonio Public Service Co.

Seventeen cash prizes totaling $300 were awarded in the Refrigerator Purchasers' Contest. Contestants were confined to those purchasing a modern refrigerator of a make displayed at the show. Entrants were required to hand in three written reasons why a modern electric or gas refrigerator was purchased. Cash prizes ran from $50 to $5.

Other prizes, such as electric appliances and household articles, were given away at a drawing each Saturday during the show, to visitors registering at the display.

Advertising mediums for the show included newspapers, radio broadcasts, screen, billboards, bus cards, and window display cards.

Insulite Builds Line of Hardboard Products

MINNEAPOLIS — The Insulite Co., manufacturer of insulation board, is bringing out a new line of hardboard products for use in improving and modernizing homes, reports E. H. Batchelder, Jr., vice president in charge of sales.

The products are Insulite HardBoard and Tempered HardBoard, offered in five thicknesses from 1/10 in. to 5/16 in., and in panel lengths from 2x4 ft. to 4x12 ft.; Insulite DualBoard, which is made in ¼ in. thickness; and PanelTile, available in thicknesses of ⅛ in. and 3/16 in.

Matthews Electric Co. Attains Quota in G-E Race

CLEVELAND—Leading distributors to date in "Refrigerania Sweepstakes," the spring sales campaign of General Electric Co.'s specialty appliance department (based on reports received through last Saturday), are as follows:

Group 1—Matthews Electric Supply Co., Birmingham, Ala.

Group 2—The Hines Co., Baltimore.

Group 3—Electric Household Appliances, Inc., Dallas.

Group 4—General Electric Supply Corp., Portland, Ore.

Group 5—Electric Appliances, Indianapolis.

Group 6—A. Wayne Merriam, Schenectady.

Group 7—E. Pulver Cook, Providence, R. I.

Group 8—Rex Cole, Inc., New York City.

Group 9—James & Co., Inc., St. Louis.

Group 10—Electric Housekeeping, Inc., Omaha, Nebr.

Group 11—General Electric Supply Corp., Salt Lake City, Utah.

The campaign has been running five weeks in the south and three weeks in the north, the country being divided into 11 groups of distributors.

Matthews Betters Quota

In Group 1, Matthews Electric Supply Co. has passed 100 per cent of quota for the entire campaign. Close second in Group 1, is George Patterson, Inc., St. Petersburg, Fla., with 97 per cent of the entire drive's quota in five weeks.

The Hines Co. this week nosed out Perry-Browne, Inc., of Columbia, S. C., for leadership in Group 2, while Electric Housekeeping of Omaha wrested first place from Dakota Electric Supply Co. in Group 10.

Cole Commercial Sales Good

The sales campaign covers all G-E home appliances, as well as commercial refrigeration. Rex Cole's New York commercial organization has passed its entire campaign quota on commercial in three weeks time.

Individual salesmen are establishing many outstanding sales records during "Refrigerania Sweepstakes." Here are a few reports for the past week:

Stryker Aids Dealers

B. W. Stryker, wholesale specialist for A. Wayne Merriam, Inc., Schenectady distributor, with Dealer H. V. Putman of Amsterdam, N. Y., sold a 12-ft. display case complete with refrigeration one morning last week.

In the afternoon, he drove to Canajoharie, N. Y., where, with Dealer H. S. Billington, he sold a complete General Electric kitchen, which includes a 7-ft. Monitor Top refrigerator, a G-17 range, and an ESF model dishwasher. Came sunset and dinner. Then, again with Billington, he visited the Montgomery county jailer, and by 1 o'clock in the morning had sold him a large walk-in box to keep the jail fare fresh and wholesome.

Other Merriam Men High

Other Merriam retail men who are going strong include A. S. Sorenson, who during the first three weeks of the sweepstakes campaign sold $7,595 worth of refrigeration; E. A. Terpening, $8,204; and L. B. Holt, $11,538.

Holt, who has been a member of the G-E Toppers' Club for four years, who is a graduate of the G-E LaSalle salesmen's training course, and who was a winner of the last G-E sales campaign, the "All Star Discovery Drive" is out to duplicate his sales accomplishments of that contest. During the All Star Drive of nine weeks, Holt sold $31,877 worth of G-E products.

T. H. Rochford of R. Cooper Jr., Inc., Chicago distributor, has sold $10,138 or 148 per cent of his quota, in the first three weeks of the campaign.

Sales at Midnight

The Page Electric Co., leading dealer in the territory of George Patterson, Inc., St. Petersburg, Fla., distributor, reports that two of its salesmen closed individual sales around midnight. One got the name on the dotted line at 11:45 p. m. and the other got the order signed at 12:01 a. m. Page Electric salesmen hold early morning meetings six mornings each week during the campaign.

James & Co., Inc., St. Louis distributor, is setting a number of records. Up to the last reports, James & Co., was leading in quota realization in its group of distributors, being fifth out of 36 in doing a balanced sales job.

Correction

The headline on page 20 of the April 17 issue of ELECTRIC REFRIGERATION NEWS reading "S-W sales & Profits Up for *Just* Two Months" was incorrect. It should have read "S-W Sales & Profits Up for *First* Two Months."

Birmingham Electric Designs Wiring Plan To Cut Range Cost

BIRMINGHAM, Ala.—The engineering department of the Birmingham Electric Co. has designed a wiring hookup that is said to reduce the cost of an electric range installation by approximately two-thirds.

A meter protective case of sufficient size to house the meter, test block, and circuit breakers controlling both the range and lighting circuits, is installed. This arrangement permits the company to own and capitalize equipment which the customer had to pay for and own under the old style installation.

Instead of the $45 or $50 installation cost under the old plan, the estimated cost of the interior wiring under the new plan is $17 per range, which includes range plug, cord, and receptacle. Birmingham dealers at present are absorbing this amount in the list price of the range, so that the customer is not required to pay anything for an installation.

The interior wiring has become a matter of installing a few feet of 3-conductor cable to the range location and an additional few feet of 2 or 3-conductor cable to the existing light switch.

Should a customer move, it is easy to move the protective case to the new address. A standard meter case could then be installed at the old address to take care of the incoming tenant's lighting, provided, of course, he did not have an electric range also.

Instead of this procedure the installation could be left intact and be devoted exclusively to lighting service, or the range circuit breaker could be removed and the meter replaced with a smaller meter to provide lighting connections for the new tenant.

Under the new arrangement, a surface type range receptacle is provided in the kitchen so that the range may be plugged in just like a floor lamp. This enables the customer without the aid of an electrician to unplug the range and move it about for such operations as cleaning, laying linoleum, or even moving to a new home. The plug also serves under the code as a disconnecting switch.

The cost of exterior wiring, which the company can capitalize, in the range installation, is estimated with quantity purchases of material at $21.83. This includes the protective case, circuit breakers, and service entrance, but is exclusive of overhead service and meter. The cost of the interior wiring is estimated on the same basis at $17.

Credit Group Condemns 'Winter Selling' Plan

(*Concluded from Page 1, Column 5*)

York; Refrigeration Discount Corp., Detroit; General Electric Co., Specialty Sales Dept., Cleveland; and National Retail Credit Association.

The following Chicago retailers were also represented: Montgomery Ward & Co.; The Fair; Mandel Bros.; Wieboldt Stores; and Carson, Pirie, Scott & Co.

Chairman of the meeting was J. B. Perlee, vice president of the Merchants Discount Corp., Duluth, Minn., and chairman of the Diversified Financing Committee of the National Association of Sales Finance Companies.

"It was the unanimous opinion of those present," said Mr. Crowder, "that the time payment price should reflect the expenses involved, such as credit investigation, capital invested, cost of handling, including repossessions, and reconditioning of repossessed merchandise."

It was also agreed, he stated, that the cash price and time payment price should be publicly displayed, and the difference between the cash and time payment prices designated as a carrying charge.

"It was recommended that the maximum time should be determined by the life of the merchandise, depreciation, and obsolescence influencing the terms of payment," Mr. Crowder said.

"These terms," remarks Mr. Crowder, "have since been adopted by the National Association of Sales Finance Companies as the standard sale terms of that organization.

"Also," he continued, "it was further recommended that the Winter Selling and similar plans for refrigerators and Summer Plans for oil burners be kept within the schedule of recommended standard terms.

Mr. Crowder recommends the adoption of the terms outlined and that a carrying charge of not less than one-half of 1 per cent per month, be added on the deferred balance. He also recommends that any account not paid within 60 days be considered a time payment sale.

It is Mr. Crowder's opinion that a carrying charge of this amount is necessary to cover all items of expense, and that no part of such expense should be buried in the credit office expense and borne by the monthly charge account business.

DANGLING

EVERY dealer has them: instances where an interested prospect raises hopes of a sale which in the end falls through. Usually it is a question of money—either trouble and delay in raising the purchase price or secret reluctance to part with it.

Push the convenient way of buying—on the C. I. T. Plan, and quickly close many sales that might otherwise drag on and be lost.

For an instalment sale is a quick sale when it is financed through C. I. T., which through its Local Office close-by can speedily pass credits and cash paper. Moreover its skilled nation-wide organization affords protection in the matter of collections as well as in the handling of credit detail generally.

C. I. T. Service covers approved types of mechanical refrigerators and water coolers, as well as electric ranges and air-conditioning equipment. Costs are uniformly low, and the Plans notably free of red tape. This coming year feature the C. I. T. Deferred Payment Plan, for more and quicker sales, at a profit!

C.I.T. CORPORATION

NEW YORK — CHICAGO — SAN FRANCISCO

Completely Functioning Local Finance Offices in the Principal Cities

CALL TODAY OUR NEAREST LOCAL OFFICE

Abilene – Akron – Albany – Altoona – Amarillo
Asheville – Atlanta – Augusta – Bakersfield
Baltimore–Bangor–Bay Shore–Beaumont–Beckley
Binghamton – Birmingham – Boise – Boston
Bridgeport – Bronx – Brooklyn – Buffalo – Butte
Camden – Cape Girardeau – Cedar Rapids
Charleston – Charlotte – Chattanooga – Chicago
Cincinnati – Clarksburg – Cleveland – Columbia
Columbus–Cumberland–Dallas–Dayton–Denver
Des Moines – Detroit – El Paso – Erie – Florence
Fort Wayne – Fort Worth – Fresno – Glens Falls
Greensboro–Greenville–Hagerstown–Harrisburg
Hartford – Hempstead – Hickory – Houston
Huntington, W. Va. – Indianapolis – Jacksonville
Jamaica – Jamestown – Jersey City – Johnson City
Kansas City – Knoxville – Lexington – Lincoln
Little Rock – Los Angeles – Louisville – Manchester
Memphis – Miami – Milwaukee – Minneapolis
Mobile – Montgomery – Montpelier – Mt. Vernon
Nashville – Newark – Newburgh – New Haven
New Orleans – New York – Norfolk – Oklahoma
City – Omaha – Orlando – Paducah – Paterson
Peoria – Perth Amboy – Philadelphia – Pittsburgh
Pittsfield – Portland, Me. – Portland, Ore.
Portsmouth – Poughkeepsie – Providence – Raleigh
Reading – Reno – Richmond – Roanoke – Rochester
Rome, Ga. – Sacramento – St. George – St. Louis
Salt Lake City – San Antonio – San Diego
San Francisco – San Jose – Scranton – Seattle
Shreveport – Spartanburg – Spokane – Springfield
Mass. – Springfield, Ohio – Stockton – Syracuse
Tampa–Toledo–Tucson–Tulsa–Utica–Washington
Watertown – Wheeling – White Plains – Wichita
Wilkes-Barre – Wilson – Yakima – Youngstown

A Unit of COMMERCIAL INVESTMENT TRUST CORPORATION—CAPITAL AND SURPLUS OVER $75,000,000

the average General Electric dealer enjoys a 12-TIME TURNOVER on G-E Refrigerators

A STOCK TURN of 12 times a year on refrigerators means a successful, thriving business. The average General Electric refrigerator dealer is getting it. On such a rapid turnover, his money is not tied up in burdensome stocks. He has no obsolescence problems. His business moves fast, averaging 12 profits a year instead of the usual 6 or 7.

What accounts for this quick turnover?

FIRST

Increasing public preference for the General Electric refrigerator. The public is becoming more and more conscious of the fact that in an electric refrigerator *performance* year after year outweighs in value all other features combined. The performance record of the General Electric has never been equalled by any other refrigerator. It is the ONE outstanding feature in electric refrigeration today. It is drawing an ever increasing number of buyers to the G-E dealer's store.

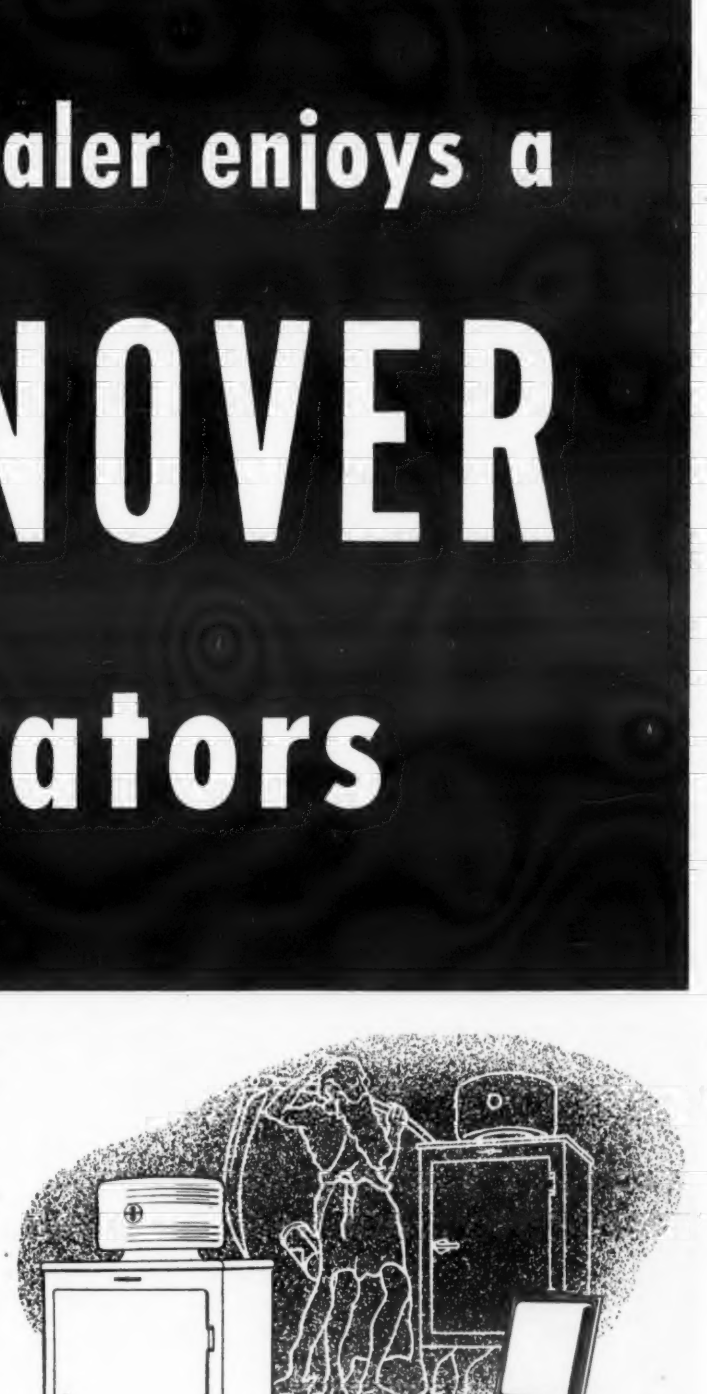
SECOND

The G-E dealer can offer refrigerators of *any* type, *any* size, *any* price—and they are all General Electrics! Concentrating on *one* make his turnover is naturally accelerated. His sales effort, interest and enthusiasm are all on the *one* make, not divided among several. Naturally he sells more refrigerators.

THIRD

General Electric's great warehousing facilities permit the dealer to carry smaller inventories for he can get rapid delivery to replenish his stock.

Combined with these *exclusive* features of the G-E refrigerator franchise are the added advantages of: A complete line of General Electric Kitchen Appliances. The most effective sales training program in the industry. A huge advertising and sales promotion campaign. Powerful store merchandising and store identification activities. All have their effect on faster turnover and greater net profits. Write or wire for details of the G-E franchise. General Electric Company, Specialty Appliance Department, Section DF42, Nela Park, Cleveland, Ohio.



THE MECHANISM THAT DEFIES TIME

Now in all 3 types of refrigerators . . . Monitor Top, Flatop and Liftop. All carry 5 Years Performance Protection on the "ageless" G-E sealed-in-steel mechanism for $5—only $1 a year.

GENERAL ELECTRIC

ALL-STEEL REFRIGERATORS

Willkie, Commonwealth & Southern Head, Proposes 4 Amendments to TVA Act

WASHINGTON, D. C.—Testifying on the McSwain bill that would clarify the TVA act and enlarge some of the authority's powers, Wendell L. Willkie, president of Commonwealth & Southern Corp., told the House Military Affairs committee last week that his company could pass on $30,000,000 in savings to electricity consumers under a financing method such as is available to TVA.

Mr. Willkie proposed four amendments: (1) That TVA, where there are existing power facilities, shall not sell its services, retail or wholesale, without buying or condemning those facilities; (2) That TVA comply with the uniform accounting system of the National Association of Railroad and Utilities Commissioners, with which private utilities must comply; (3) That TVA charge rates high enough to give the government a fair return on its electric generating, transmission, and distribution systems; (4) That TVA file rates with the power commission, maintain uniform rates in towns served, and not discriminate between classes of consumers.

Appearing on behalf of the bill, Arthur E. Morgan, TVA chairman, told the House committee that the TVA program offered possibilities of developing one of the world's greatest industrial centers, and of cutting 600 miles from the water route between central United States and the Gulf.

He asserted that the single integrated plan, bringing power, navigation, and flood control under the TVA also would make each phase of the work cheaper and more feasible.

In a letter to Rep. Thom (Ohio), President Roosevelt had previously denied that the TVA was attempting to persuade northern industries to move to the Tennessee Valley area, charging that "special interests are constantly attempting to thwart the program which Congress has set up for the Tennessee Valley."

The bituminous coal industry also entered the fray. John D. Battle, executive secretary of the National Coal Association, told the House committee that government-subsidized hydro-power would be disastrous to the bituminous coal industry and endanger the jobs of 400,000 miners. He charged the bills to amend the TVA act were especially designed to circumvent the recent decision rendered by Federal Judge Grubb, in which he held TVA sale of power was illegal.

E. A. Yates, vice president and chief engineer of Commonwealth & Southern Corp., told the committee there was no truth in the assertion that the Tennessee Valley area is dependent for electric power upon government-constructed projects.

Legislation to open up to state and municipal taxation all of the electric power developments of the federal government is being drafted by Rep. Pettengill (Ind.). Loss of revenue to local governmental bodies through operations of the federal authorities is becoming acute in certain sections of the Tennessee river valley, Rep. Pettengill declared.

"I have no objection to, and I approve of, the federal government exercising control over the great water power resources of the country," Rep. Pettengill said. "However, this does not mean that the federal government should build dams and generate power. The government can lease this property, under restrictions, to private companies."

Charge Dismissed in Case Involving Replevin of Refrigerator

DETROIT—Breaking and entering charges against two employees of a Detroit trucking company were dismissed by Judge Arthur E. Gordon in recorder's court last week, and the examination of Constable G. G. Burk on the same charge was adjourned to allow Assistant Prosecutor Sid A. Erwin to file briefs on the points involved.

The three men were accused of breaking into the home of Mrs. Marguerite M. Groff, to replevin a refrigerator on which she had paid about $345, and on which the Refrigeration Discount Corp. claimed she still owed about $6. Mrs. Groff charged the men destroyed her property maliciously.

The point at issue is whether the constable served Mrs. Groff's son, who was home alone, with a replevin before the men broke their way into the house.

Pawtucket Utility Adopts Trial Plan

PAWTUCKET, R. I.—The Blackstone Valley Gas & Electric Co. is launching an electric refrigerator campaign based on a trial plan, offering to place a 2 or 3-cu. ft. box in the home on trial until Aug. 1, 1935. A charge of $1 per month will be made during the trial period.

At the end of the trial period, the box can be returned, purchased with the rental fee credited to the purchase price, or changed for a larger size with the rental fee still remaining to the customer's credit.

A TRAY FULL OF TRICKS!

"COLD FACTS"
No. 4

The prospect who says, "I can't QUITE make up my mind" is often won over by Flexible Rubber Trays and Grids. INSIST that ALL models of the refrigerator you sell come factory-equipped. Write to your manufacturer or direct to us. The Inland Manufacturing Co., Dayton, Ohio.

Salesman: "And in addition to all its other advantages, this refrigerator comes equipped with Flexible Rubber Trays and Grids."

Prospect: "Well—that settles it! My husband insists on having rubber trays."

Dozens of Attempts to Improve Ice Trays Have Come and Gone—But

Flexible Rubber Trays and Grids

Are More Popular Than Ever!

Corrections, Questions & Suggestions On Household Unit Specifications

Coldspot Weights

Sears, Roebuck & Co.
Chicago, Ill.

Editor:

It has been called to our attention that the weights of the different model Coldspots listed in the "specifications" issue of ELECTRIC REFRIGERATION NEWS are incorrect.

Our correct weights are as follows:

Model No.	104	216	326	328
Crated	275	396	440	503
Uncrated	228	321	352	415

Would you please issue a correction in an early issue?

Incidentally, you have threatened to call on us on one of your "jaunts" to Chicago, but have never carried out said threat. Why not?

E. GUDEMAN.

G-E Refrigerant

J. George Fischer & Sons, Inc.
Lapeer at Weadock
Saginaw, Mich.

Editor:

We enclose herewith our check in the amount of $1.75 for which please send us seven sets of the March 20, 27, April 3 and April 10 issues of ELECTRIC REFRIGERATION NEWS for our salesmen as per your special offer just received.

On reading the specifications of the General Electric refrigerator in the March 20 issues, we note that it specifies sulphur dioxide used in all models. The local General Electric dealer claims that this is a misprint and that the General Electric is using methyl formate in all of its current models.

We will appreciate it very much if you will advise us whether or not your specifications which show sulphur dioxide are incorrect.

J. GEO. FISCHER.

Answer: The information as published in the specifications issue was correct. Sulphur dioxide is being used in all G-E 1935 household electric refrigerators.

Montgomery-Ward Capacities

The S. A. Long Electric Co.
Wichita, Kan.

Editor:

Please refer to your March 20 issue. We are wondering if there could be an error in the I.M.E. rating of the ⅛-hp. Montgomery-Ward Co. refrigerator.

We note that the rating on the ⅛ hp. is given as 94 lbs. I.M.E., but it jumps to 175 lbs. on the ⅕ hp. This rating seems to be out of line with the rating given other refrigerators using ⅛-hp. compressors and, for this reason, we question the accuracy of the figures.

Won't you please check this and advise.

R. L. WOOD,
General Manager.

Answer: The figures as published were correct. One of the factors to be taken into consideration is the fact that the ⅛-hp. model is a twin-cylinder compressor.

Universal Cooler Model 835 Price

Price of model 835 (8.1 net cu. ft. capacity) of the Universal Cooler line of household electric refrigerators, given in the March 20 specifications issue as $209.50, was incorrect.

Correct price of this Universal Cooler model is $249.50.

Specifications for Previous Years

1271 East Eighth St.
Brooklyn

Editor:

I have received the specifications for 1935. I should like to know if I can obtain the specifications of the past six or seven years (and earlier ones if possible).

An immediate reply will be appreciated, for which I am enclosing a self-addressed envelope. Also, kindly state the charges for said specifications.

J. BARTINI.

Answer: Specifications for 1934 were published in the 1934 REFRIGERATION DIRECTORY AND MARKET DATA BOOK which is still available at $3.00 per copy.

Specifications for the fall of 1932 were published in a supplement to the 1932 DIRECTORY and we still have copies of this book available at $2.00.

Specifications for previous years were published from time to time in ELECTRIC REFRIGERATION NEWS but they were never collected in one comprehensive group until the 1932 DIRECTORY, mentioned above.

There has been some demand for specifications of all models of all makes, going back for several years and we are considering the possibility of collecting all this material into a single volume. We have had some doubt as to whether the sale of the books would justify the expense and we are therefore glad to know of your interest.

Engineer Suggests Standard Terminology on Controls

General Electric Co.
1 River Rd., Schenectady

Editor:

In the March 20 issue of the NEWS specifications were given covering a large number of refrigerators. Under "Control" the features were described in various ways, some of them meaning the same thing and described correctly and others being described incorrectly. Following is a list of descriptions as given.

Temperature Control

1—Automatic.
2—Manual.

Defrost

1—Manual defrost with automatic reset.
2—Semi-automatic.
3—Wide cycle defrost.
4—Temperature control with defrost position.
5—Manual defrost.
6—Manual defrost with automatic return defrost.
7—Automatic.

Vacation Cycle

1—Vacation cycle.

Temperature control was described as automatic and manual. The chances are that all of them have the same type of temperature control which is automatic starting and stopping controlled by the temperature on the evaporator or the pressure in the system, and a knob by means of which the temperature can be raised and lowered. This knob, of course, is operated manually. I believe a better way to describe this feature would be to say "adjustable" instead of "automatic and manual."

A number of methods of obtaining defrosting are used and I suggest the following classifications:

1—"Manual" this means that the motor is shut off by means of a switch on the control and remains off until the user closes the circuit.

2—"Wide Cycle" this means that the user moves either the switch or temperature knob to the "defrost" position, whereby the cut-in temperature is raised to a value which permits defrosting. The opening value is approximately the same as on the ordinary setting. This feature gives refrigeration. When defrosting is completed, the user will return the knob to the standard setting.

3—"Semi-Automatic" this means that the user moves the knob on the control to the "Defrost" position which raises the cut-in value to a temperature which permits defrosting. When this temperature is reached, the control mechanism will automatically return to the standard position.

4—"Automatic" this means that defrosting is taken care of by opening the motor circuit for a definite length of time every 24 hours or possibly a longer period. A definite time after the circuit is opened, it is again closed by the clock mechanism and refrigeration is obtained on the standard cycle.

"Vacation Cycle" means that the cut-in point is raised above the standard value, but is below the defrost value, the cut-out point remaining practically the same as on the standard setting.

There probably are a number of ways whereby refrigerator manufacturers can be asked to standardize on definitions, but I think that through your magazine prompt results can be obtained. I would appreciate your comments in regard to the above.

C. B. BRADISH,
Designing Engineer,
Industrial Control Engr. Dept.

8,262 Prospects Secured At Pittsburgh Show

PITTSBURGH—Interesting statistical facts were derived from cards turned in by visitors to the electrical appliance show sponsored by the Electric League of Pittsburgh here recently, reports E. M. Marks, editor of the *Pittsburgh Electric Leaguer*.

After eliminating duplicates and cards with insufficient details, it was found that 8,262 of the 27,000 prospects who attended the show gave names and addresses and expressed interest in one or more of the major appliances displayed.

It was also noted that 5,059 prospects were interested in refrigerators, 1,733 in ironers, and 1,576 in radios. Washer information was sought by 1,194 prospective buyers and vacuum cleaners by 779.

The purchasing power shown by the filled in cards total consumer interest of approximately $1,220,930 at average retail prices, says Mr. Marks.

Be sure the name

FRIGIDAIRE

is on the refrigerator you sell

When you sell Frigidaire, you benefit by a very decided public preference—a preference so great that three million Frigidaires have been built and the manufacture of the Fourth Million is now under way. • People *want* Frigidaire. And it's easier to sell them what they want than to try to convince them that something else is "just as good."

—AND ONLY THE GENUINE FRIGIDAIRE IS THE *GENERAL MOTORS* REFRIGERATOR

PERSONALITIES

By George F. Taubeneck

George Forrest Drake

Readers who have been around the industry some time frequently write to say that one of the things which pleases them a lot about ELECTRIC REFRIGERATION NEWS is that through its columns they can keep up with the peregrinations (*moving around* to you) of their old friends in the industry.

While reading the page proofs of the current issue we experienced the same sort of thrill. There, right smack in the middle of the Patents page, was a patent on a thermostat granted to GEORGE FORREST DRAKE of Rockford, Ill.

Mr. Drake was one of the best friends—and one of the few fraternity brothers we really liked after the second year—the writer had at the University of Illinois.

Yet, despite Drake's remarkably brilliant record down there, we had heard not a word, nor seen hide or hair of him since the day we got the wrong diplomas.

And now, by golly, it turns out that he is in the refrigeration business, and is living up to his early promise.

In all its history, only one man ever completed the four years of study for a bachelor's degree at the University of Illinois with a straight A average (he received an "A" in every course he took during the four years!). That man was GEORGE FORREST DRAKE.

What's more, he hung up this record while majoring in engineering physics, which is just about as tough as they come.

DAN WILE, and other bright young men in the refrigeration control business, will please move over. Mr. Drake is crowding the hero's bench.

• • •

Allen C. Staley

On page 16 of this issue, and also on this page, you will see some photographs taken around the air-conditioning department of the Chrysler plant.

Hope we're not ostracized for these by the Walter P.'s, Sr. & Jr., for we understand that a camera gets through the Chrysler factory gates about as often as a Communist bearing a red flag.

The afternoon we were out there Chrysler's Three Musketeers of the Engineering Department — FRED ZEDER, O. R. SKELTON, and CARL GREER—had gone to a funeral, but we did get to meet an extraordinarily interesting man, ALLEN C. STALEY.

Mr. Staley is the chief engineer in charge of all non-automotive projects of the Chrysler organization, and as such he has the direction of the new Airtemp air-conditioning division.

Once a professor of engineering at Purdue, Mr. Staley came to Chrysler to help that concern diversify its products. He had had a variety of practical engineering experience—he seems always to have had a good job —including considerable work in the field of steam automobiles (remember the old Stanley Steamer?).

An unusually able man, Mr. Staley is no textbook engineer. Despite his executive duties, he is a shirtsleeves-and-sliderule engineer who believes in doing the dirty work himself. That's one sure way to win the respect and admiration of subordinates, which is exactly what he has won around the Chrysler plant.

Incidentally, one of his associates, AL KNIGHT, who used to be a professor at the University of Michigan, turned out to be the father of none other than BETTY KNIGHT, secretary to Managing Editor Phil Redeker.

Betty, who has a special talent for keeping out of the way, and who talks for publication about as much as a member of the vanishing race of Frigidaire branch managers, had never mentioned it.

• • •

How It All Began

WALTER P. CHRYSLER, Jr., gets the real, honest-to-John credit for the Chrysler organization being in the air-conditioning business now, according to Mr. Staley's story.

Oh, of course, they'd have been in it sooner or later, but it was Walter's impatience to get started which really made the Chrysler engineers get down to brass tacks on the subject.

For some years, under Mr. Staley's direction, Chrysler engineers had been studying and experimenting with air conditioning. They were making progress, too; but were proceeding leisurely, with the thought that maybe by 1936 or 1937 the market might be ready.

And then Walter, Jr., who was managing the cloud-poking Chrysler Bldg. in New York City, became intensely interested in air conditioning through his experiences in installing such equipment in that building. He discussed it with Walter, Sr., with Mr. Staley, and with others in the organization.

One day he called up Mr. Staley, and said:

"Allen, I've got a sales organization all set down here. We're rarin' to go. How about it? Do we go into the air-conditioning business NOW?"

Mr. Staley figured that it was as good a time as any to make the plunge, and capitulated.

Activity became feverish. Work on other laboratory projects was suspended. Space after space in the Chrysler plants was commandeered. Other engineers, experienced in all phases of air conditioning, were brought into the picture.

And in record time a complete line was ready for the selling organization which Walter, Jr., went ahead to complete—with all the fire of youth, ambition, high hopes, and enthusiasm for the future of an idea.

Today Mr. Staley is spending a not inconsiderable portion of his time trying to figure out how to get more floor space for his rapidly growing department.

And that, ladeez and gennemun of this fine audience, is the Genesis of Airtemp.

• • •

Carrier Dealers

We've been saving for this air-conditioning issue a number of little stories about Carrier dealers and what they did last year, which we picked up on our last visit to Newark.

These stories aren't exactly news (they lack the time element), and they are just sketchy notes; but they're interesting and informative, and help round out our series of air-conditioning surveys of installations by cities, so maybe it will be okey-doke to tell them here.

Howzabout it, huh?

Thank you. We'll proceed:

• • •

Kansas City, St. Louis

Last year Carrier dealers in the Kansas City area showed an 85 per cent increase in sales over 1933, according to H. G. STRONG, dealer contact representative for that territory. There are 13 dealers in Missouri, Kansas, and Nebraska.

The Gustin Bacon Mfg. Co. of Kansas City, under the direction of J. F. STEVENS, with MYRON RUDIO as head of the air-conditioning department, early this year decided to air condition its own offices for the comfort and efficiency of their employees.

During the stifling weather in the drought, this proved to be a most effective advertising medium. They held dinners in their offices, and invited leading men in the community to attend. The dinners were a hit, and several actual sales of Carrier equipment resulted from them.

The Gustin Bacon organization works closely with the Air Conditioning Council of Kansas City.

Sears & Piou of St. Louis lead off the list in this district with 34 installations, and had a dollar volume more than double that of the previous year in spite of the fact that their largest single sale was only one-third the size of the largest sale in 1933.

This year the Empress Theater with seven Weathermakers and seven Carrier Brunswick refrigeration machines was the high spot of their selling and engineering activities. HERB PIOU sold this job to replace almost new equipment purchased from a competitor—equipment which was inadequate because of a poor job of estimating.

When Sears & Piou contracted to air condition a market this summer, part payment was arranged with certificates redeemable in groceries and meats at the market. These certificates were divided up among the salesmen and employees of the Carrier dealer.

Hearing somehow about this convenient and easy method of paying for the comforts and benefits of a Carrier system, it is said that a local funeral parlor phoned Sears & Piou and asked for the same deal. But this time the boys wouldn't go along.

• • •

Richmond, Va.

H. L. BROWN and L. W. LONG, partners in the operation of Richmond Air Equipment Co., Richmond, Va., both have Carrier Room Weathermaker installations in their homes.

This company also has a theater job to its credit—the State—which uses two 39-E-6 Weathermakers, and other jobs, including the offices of the Virginia Paper Co.

• • •

Buffalo

The Cooney Refrigeration Co., Inc., a Buffalo concern, has been doing a state-wide business in commercial refrigeration for the past eight years —first as a Kroeschell distributor, then as a Brunswick distributor, and lastly as a Carrier dealer.

This concern made the initial Freon installation in the city of Buffalo—a fur storage vault for the Wm. Hengerer Co., in which it was necessary to carry normal temperatures of 34°, but to conform with the specifications the equipment had to be of sufficient size to reduce the room temperatures from 40° to 15° within eight hours. Two No. 1543 diffusers with a No. 25 condensing unit with fully automatic controls were installed.

(On our last trip to Buffalo we were shown this installation by one of the smartest young women we have ever met—Buyer LORINDA McANDREW of the William Hengerer Co.)

The O'Day Marble Bar, a restaurant and tap room, was next. This restaurant had just been completed, and the owner was convinced that air conditioning was an absolute necessity. A 56-75-WM condensing unit, a 39-M-2 Store Weathermaker, and two room cabinets were used on this job, which is automatically controlled for both winter and summer use.

Increased cash receipts during the hot summer months of 1934 showed the proprietors conclusively what air conditioning can do for the food-serving business.

The Buffalo General Electric Co., a property of the Niagara & Hudson Power Co., awarded a fine contract to the Cooney Refrigeration Co.—that of air conditioning their demonstration room, home service offices, and model kitchen.

• • •

Atlanta, Miami

WARREN CLARE, operating under the name Clare & Co., undertook a big job on the S. & W. Cafeteria in Atlanta. He installed four 39-M-7 Store Weathermakers and eight 56-100 WM compressors, using a cooling tower for condenser water requirements. During one of the hottest summers on record (1934) this job performed satisfactorily, meeting unexpected peak loads.

Warren again distinguished himself when he disguised a cooling tower as a bird haven for a wealthy man's residence in an exclusive residential section of Atlanta. The residence utilizes a gas fired Weathermaker and two 54-30 WF compressors. The idea and the job went over big.

Other installations by Clare & Co. include the Atlanta offices (headquarters) of the Coca-Cola Bottling Co.

Topping the list of the Fuel Oil Equipment Co. of Miami is a Woolworth store and the Chez Marie Beauty Parlor, which has received considerable publicity in beauty trade journals as the first completely air-conditioned beauty salon in the country.

One of the problems of such establishments is excessive heat and odors in the shops during the hot weather months. Many women who want a permanent wave put it off until fall because of the ordeal of sitting under an electric heating machine in a stuffy room. So-o-o-o, the beauty parlor business lags in summer.

This unique installation overcame this problem, and so increased the shop's business that additional air-conditioning equipment was ordered.

• • •

Cleveland

The Smith & Oby Co. of Cleveland is intensely interested in the promotion of definite standards for figuring air-conditioning jobs in Cleveland, as suggested in the editorial, "Establishing Prices for Air Conditioning" in the March 27 issue of ELECTRIC REFRIGERATION NEWS.

This company made an unusual installation for the Cole Shoe Store in Cleveland. A 5-ton Freon compressor and a 39-L-6 Store Weathermaker were installed. A header across the front of the mezzanine at the ceiling was used for distributing the conditioned air throughout the store.

It is generally agreed among engineers in this territory that the Cole job is not only effective in conditioning the store, but the duct work is installed in such a manner as to add materially to the appearance of the place.

One of the finest air-conditioning jobs to be installed in Akron is credited to the Hal K. Jennings Engineering Co., Carrier dealer—that of Rogers, Inc., a smart women's ready-to-wear shop.

Jennings did another fine job when he sold the Polsky store on the idea of abandoning a CO_2 compressor, six years old, and redesigning their entire refrigeration system, using several 50,000 series compressors and cold diffusers.

This job was sold on the basis of the savings that could be effected. Mr. Jennings' foresees high possibilities of profitable volume in replacement business.

• • •

Louisville

The Brandeis Machinery & Supply Co. of Louisville, one of the four leading Carrier dealers in sales for the country in the past year, air conditioned the studios of radio station WAVE, the only installation of its type in the territory.

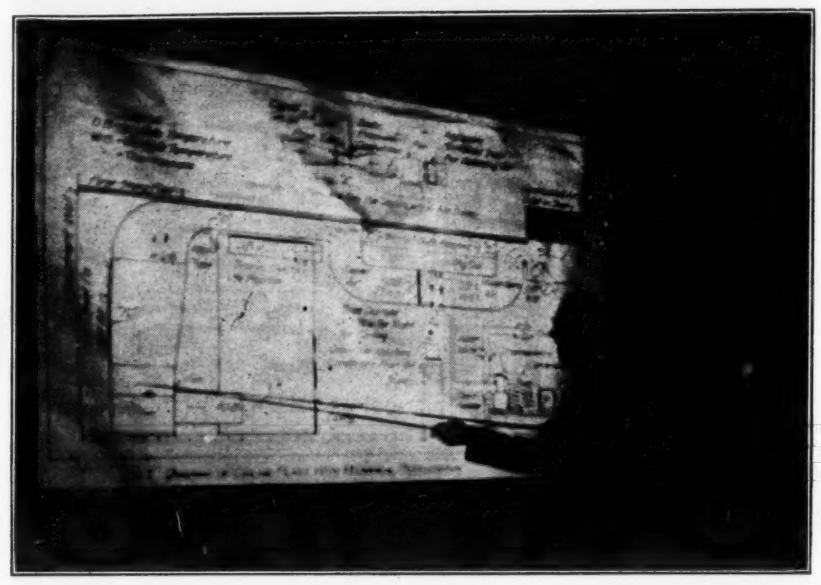
A 39M-2 Weathermaker and a 55-50 WM compressor were used with standard sound absorbers, positive return and special pan type outlets.

Stewart's Department Store was another installation made by this concern. Four floors were equipped for summer cooling with nine 39-L units and a steam machine of 150-ton capacity.

Brandeis also obtained a giant order from the Federal Emergency Relief Commission for 24 compressors, 52-10 AM; 30 No. 52-15 AM; 27 No. 53-20 WM; 17 No. 54-30 WM; and 159 No. 1400 series cold diffusers.

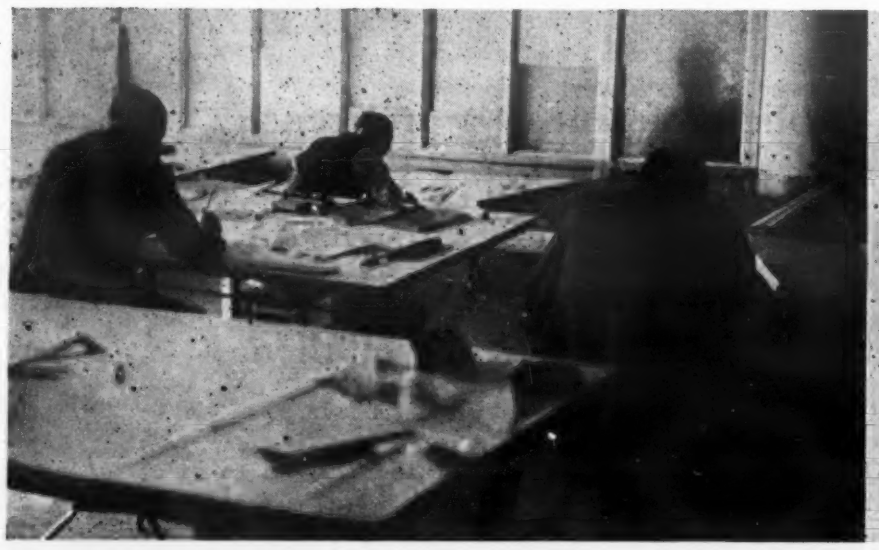
Another among the notable jobs landed by this same dealer was that of cooling the Grill Room of the Brown hotel. This job called for two 56-100 WM compressors and a 39L-7 Weathermaker. Because of the odd decorations of the grill, some difficulties were encountered, but it was finally installed O.K.

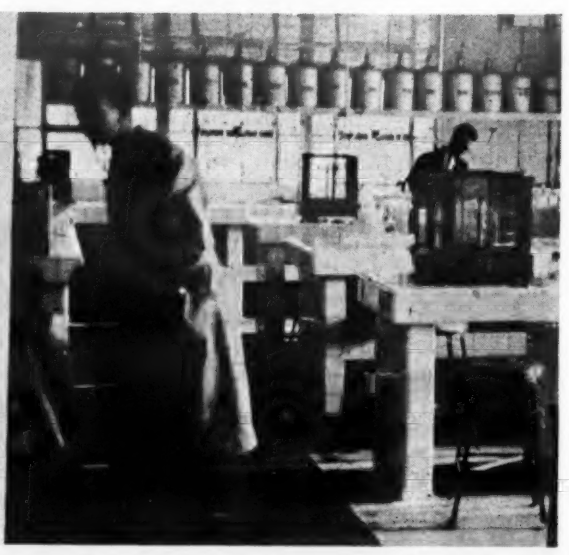
Prof. Kratz Makes a Point



". . . This fan delivered approximately 1,300 cu. ft. of air per minute when recirculating the air in the house, and 2,200 c.f.m. when using outdoor air at night . . ." Prof. A. P. Kratz explains the operation of the cooling plant in the University of Illinois research residence at Urbana to Detroit members of the A.S.R.E. and A.S.H.V.E. at their recent April meeting.

Chrysler Air-Conditioning Engineers Plan and Test New Comfort Cooling Equipment





(1 and 2) Chrysler air-conditioning designing engineers at work in their quarters in the Amplex division of Chrysler's Detroit plant—planning developments which they hope will make the name, Chrysler, as well known in air conditioning as it is in the automobile world. (3) In the engineering laboratory.

It's coming fast

—and where will you be?

Have you been giving proper consideration to your normal replacement market? More than 30 per cent of the wired homes have electric refrigeration. Many bought their refrigerators eight years ago, ten years ago and even longer. Many bought within the past two years, but unfortunately, they purchased refrigerators that were too small, refrigerators that have since become "orphans," refrigerators that, to the experienced eye, were built to meet a low price by manufacturers who were obviously out to take the "cream" with no thought or worry about the people who bought their product.

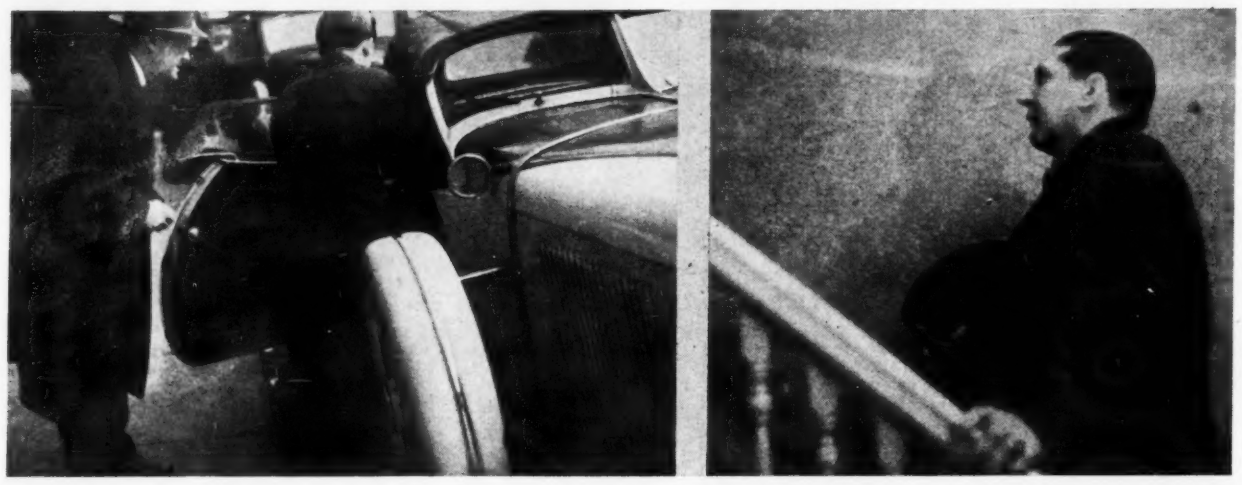
These owners of electric refrigerators have, in varying degrees, enjoyed the advantages and conveniences that this great household utility gives. They are not going to be content without it. On the other hand, they realize they have chosen unwisely and having been "burned," once, they will not be "burned" again. Their next choice will be an established make—a refrigerator that has stood the test of time, one that has earned the reputation of being a QUALITY PRODUCT.

Kelvinator dealers, distributors and salesmen are in an exceptionally advantageous position to cash in on this replacement business. And as time goes on, they are going to benefit more and more from Kelvinator's policy of building only *quality merchandise.* . . . KELVINATOR CORPORATION, *14250 Plymouth Road, Detroit, Michigan. Factories also in London, Ontario, and London, England.*

(1125)

K E L V I N A T O R

This Refrigeration Business Is Always on the Move



Men connected with the refrigeration industry don't have time to sit down during this busy spring. (1) Walter Daily, formerly G-E appliance sales promotion manager and now head of his own advertising agency, puts his bags in the editor's Auburn for a quick trip. (2) J. K. Knighton, new Kelvinator air-conditioning sales manager, says Kelvinator air-conditioning sales are climbing.

G-E Sales Gain 16% In First Quarter

SCHENECTADY—Sales billed by General Electric Co. for the first quarter of 1935 amounted to $40,393,538, compared with $34,935,551 for the same quarter a year ago, an increase of 16 per cent, Gerard Swope, president, reported to stockholders of the company at the annual meeting held here last Wednesday.

Profit available for dividends on the common stock totaled $5,390,930 for the first quarter of 1935, as compared to $3,921,961 for the first quarter of 1934, an increase of 37 per cent.

Orders received during the first quarter of 1935 amounted to $49,379,932, compared with $38,148,654 for the same quarter of 1934.

One new director was elected to the board—Lewis Blair Williams, chairman of the board of the National City Bank in Cleveland.

New Appliance Store in San Francisco Sells Refrigerators

SAN FRANCISCO—The Pacific Electric Appliance store, carrying a complete line of refrigerators, radios, vacuum cleaners, washers, and other electrical appliances, was recently opened here with William C. Cannon and J. D. Cleary as co-partners.

Dealer Capitalizes When Refrigerator Falls From Delivery Truck

LOUISVILLE, Miss.—Spills spell sales for Marvin C. Moody, Crosley dealer in this small city.

Mr. Moody is using a Shelvador electric refrigerator which figured in an odd accident recently as the basis of a clever promotional campaign.

He had sold a Model FA-50 refrigerator to a woman in Louisville, and not having a delivery truck himself asked a local groceryman to make delivery for him. In a hurry to reach his destination, the groceryman rounded a corner in the center of the town's business district.

Refrigerator Fell 7 Feet

The grocer had picked up a colored lad to help hold the refrigerator on the truck. In rounding the corner, both the boy and refrigerator were thrown off, falling about seven feet to the pavement. Mr. Moody, who was following the truck in his car, narrowly escaped running over the refrigerator as it fell.

Getting out of his machine, Mr. Moody ran over and retrieved the top of the refrigerator, which had sailed through the air—and found that it had not even been scratched. The refrigerator was loaded back on the truck and returned to the store for inspection. A unit of different size was delivered to the customer, since the fallen FA-50 was the only model of its capacity that Mr. Moody had in stock.

"We taped the cord in three places where it had been cut by broken glass from the glass tray which fits beneath the ice compartment—which proved to be the only thing broken in the fall," Mr. Moody said. "Even the electric light in the cabinet was not injured, and burned brightly when the current was turned on. We took out the plate on which the motor and compressor are mounted, straightened it out, put it back in place, plugged the cord into a light socket, and the refrigerator ran as if nothing had happened to it."

Unit Put on Display

The accident created considerable attention, happening as it did in the middle of the city, and many people who had seen the mishap came to the store to see what disposition was to be made of the refrigerator. Among them was a woman who was passing the scene of the accident in her car. When she saw the refrigerator in operation, she gave Mr. Moody her order for a unit of the same size.

Mr. Moody has placed the refrigerator in front of the store, with the following sign:

"They Can Take It—This Crosley Refrigerator was thrown from a delivery truck while traveling at a rate of speed of 30 miles per hour. A 7-foot fall on brick pavement.

"Examine it—it has one new part—the glass tray under the ice compartment, and it is running nice—no service man has been called—see this Shelvador on demonstration."

Mr. Moody says he has received several offers for the refrigerator that was in the accident. But he has decided it's too good an advertisement to sell.

Georgia Power Sends Traveling Kitchen On 2-Year Tour

ATLANTA—Mr. and Mrs. Guy Lynes, members of the home service department of the Georgia Power Co., left Atlanta April 1 in a coach equipped as an all-electric kitchen and drawn by a six-cylinder automobile on a two-year trip through the state of Georgia to demonstrate before rural and small-town homemakers how modern cooking and housework may be done.

Kitchen demonstrations will be held in 313 towns on their itinerary. Towns visited will be from Ocholochnee, a Thomas county town of only 443 people in south central Georgia, to Mountain City, a small mountain resort of 365 inhabitants in Rabun county in northeast Georgia; from Darien, county seat of McIntosh on the south Atlantic coast, to Fort Gaines, Clay county seat in southwest Georgia; and from Lincolnton, in eastern Georgia near the South Carolina line, to Cloudland, a mountain resort in northwest Georgia near the Alabama line.

The electric kitchen coach is divided into two parts. A kitchen, equipped with modern electric appliances, is at the front end. In the rear end, a small "auditorium" will seat 20 persons. The coach is approximately 21 ft. long and 7 ft. wide, inside dimensions.

The coach has a portable water supply and carries connections for tie-in with electric service wherever it may be. It is equipped with the following: an electric refrigerator, electric range, and electric water heater—the three built compactly together—a dishwasher and sink, electric mixer, electric cooker, toaster, percolator, vacuum cleaner, and other small appliances.

American Radiator Head Outlines Need For Home Building

NEW YORK CITY—The National Housing Act has brought long belated recognition of the fact that a housing problem exists in this country and as a result of the activity created under it, his company was able to show a profit last year for the first time in three years, Clarence M. Woolley, chaiman of the board of the American Radiator and Standard Sanitary Corp., declared in his recent annual report to stockholders. Detroit Lubricator Co. and American Blower Co. are subsidiaries of American Radiator.

Net profit for his company last year was $1,455,227 as compared with a loss of $881,575 for the year before and a loss of $5,990,985.94 for 1932. This was accomplished, Mr. Woolley explained, largely as a result of the work in home modernization or repairs created under the housing act and in spite of a continued decline in new residential construction.

Residential Construction

Residential construction was about 95 per cent below the average for the years from 1925 through 1929, practically obliterating this, the largest market, for the company's products, he explained.

"Significant for us and for the nation, is the fact that the National Housing Act represents recognition of the undoubted need for a housing program in this country," Mr. Woolley said.

"It constitutes an acceptance of the fact that a revival of construction is an important, probably the most important single factor in national recovery. Further, it seeks to muster the time-tried and proven forces of private enterprise to accomplish its end.

"The fundamental soundness of the act, in its provisions for insured loans to encourage the use of private rather than public capital for housing, makes it deserving of full support from business."

During the past five years, the total number of homes erected has not been sufficient to meet the need created "by the natural forces of marriage, fire, and obsolescence," Mr. Woolley asserted. Figures for 257 cities show 296,000 home units built in the period as compared with 1,992,000 for the previous five years.

There has been only one home erected for every 16 marriages while from 1925 through 1929 there was a new home constructed for every three marriages. Fire loss has been estimated at 30,000 homes a year, and, on the basis of a forty-year obsolescence period for buildings, 511,000 homes have become obsolete every year since 1930.

Last year, the construction of new homes declined from 24,557 built in 1933 to 20,846, although total construction increased about four per cent apparently due to the erection of large buildings under the government public works program, he explained.

In addition to the elemental need for more housing indicated by these figures, there is a need for better housing particularly for people in the lower income brackets.

"A nation hastily built can always be better built," he declared.

"There is an emphasis at the present time upon social service," Mr. Woolley continued. "Surely there is no more fundamental element of social service than to provide decent homes where men can live and do not merely exist."

Technological improvements and refinements in manufacturing made in the past five years have led to the production of new products that should prove a valuable aid in solving the problem of adequate housing for these groups in the United States, he said.

Further, he asserted, these refinements have made it possible for the company to increase its hourly wage scale to a point virtually equal to that for the peak period of 1929, at the same time that it has lowered the prices on sanitary ware about 40 per cent below the 1926 level and those on heating equipment about 33 per cent.

Joins Westinghouse

GRACE DIEBIG
Assistant director of the range home economics staff, Westinghouse Electric & Mfg. Co.

Provo Dealer Celebrates Remodeling of Store

PROVO, Utah—The new Knight Coal & Ice, Inc., Kelvinator store here held an open house party recently to celebrate the remodeling of its quarters, reports Heber Rupper, manager.

Ice cream molds made to represent the latest model Kelvinator were presented to visitors to the store during the day. Each adult woman received a carnation, and special literature in cooking short cuts was distributed.

In addition to the complete Kelvinator line, the store handles the General Electric line of radios, washing machines, ironers, etc., A.B.C. washing machines, and Iron Fireman stokers.

Machine Makers like ARTIC because its favorable combination of properties permits building compact, light-weight units that operate efficiently and economically.

Service Men like ARTIC because its high purity, wide distribution and ease of handling contribute to convenient, dependable work in recharging Methyl units.

Artic
REG. U. S. PAT. OFF.
(DU PONT METHYL CHLORIDE)
IS A GOOD REFRIGERANT

ARTIC is now used for charging all or part of the line of 35 makes of household and commercial units. A standard refrigerant since 1920.

Are you now receiving the periodical bulletin "ARTIC Service News"? If not, we shall be glad to put your name on our list to receive future issues. Also available: "ARTIC Service Manual" (a 32-page pocket-size book) and "ARTIC—The Refrigerant" (a 56-page 6 x 9 technical data book). Gladly sent on request.

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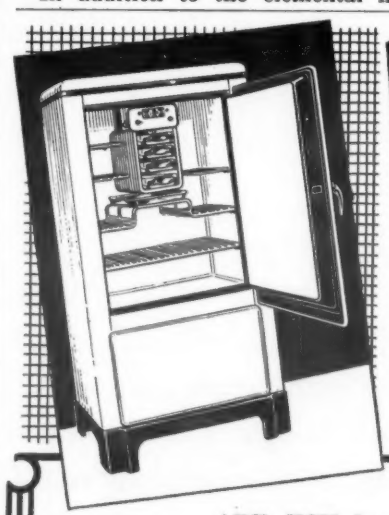

...A BIG YEAR FOR COPELAND DISTRIBUTORS AND DEALERS!

ARE YOU keeping posted on what Copeland is doing? Don't miss out on something that may prove very profitable to you. Copeland has produced a 1935 line that has proved an instant success! It has "clicked" with the public in a big way.

FOUR MODELS
All Fast Movers!

Enthusiastic dealers and distributors from coast to coast are taking full advantage of this big upswing in Copeland sales. The 1935 line is concentrated on FOUR models—skillfully gauged to attract the majority market. High quality, beautiful cabinets, skilled engineering, smooth quiet low-cost operation, priced to meet competition—all Copeland factors that build sales volume! This year, concentrate on the compact Copeland line that sells easily—with fast turnover and quick profits!

A limited number of profitable distributor's franchises are available. Get details NOW!

COPELAND REFRIGERATION CORP.
Manufacturers of a Complete line of Household and Commercial Refrigeration
Holden Ave. at Lincoln . . . DETROIT, MICH.

Copeland
DEPENDABLE ELECTRIC REFRIGERATION

Kelvinator Booklet Describes Models

DETROIT—Kelvinator Corp. has recently issued a 16-page booklet, describing and illustrating 20 refrigerator models, including six super deluxe, four deluxe, four porcelain, and six permalain units. Features and specifications are given for each model.

Action pictures illustrating the various features of the models are found on the first six pages of the booklet. The remaining 10 pages deal with the models themselves, five of which are pictured against colored backgrounds and with food contents in colors.

The first page illustrates the "4 refrigerators in 1" theme, which stresses the fact that four different temperatures are provided in the same cabinet at the same time. This feature applies to the super deluxe models.

New features pictured on page two of the booklet include the food wheel, with its five revolving crystal dishes, which slides forward and back on the shelf; the sliding fruit basket, with adjustable partitions; the rearranging shelf, which slides out from under the regular shelf for use when rearranging the contents of the food compartment or loading the refrigerator; the hinged shelf, which lifts up out of the way to provide extra space for bottles or containers next to the cooling unit, and pulls down for extra shelf space.

Modernized Equipment Reduces Operating Cost of System

DETROIT—Modernization of refrigeration equipment in conservative manner shows a profit in one to two years, writes George H. Clark in a recent issue of *Realtor and Property Owner.*

Complete replacement is better with some plants, Mr. Clark writes, but in this case cost becomes larger, and must be spread over a longer time. Obsolete machines, especially of the air-cooled type, make operating and service costs too high, and in many cases a saving may be effected by replacing two or more with one larger water-cooled unit.

Water cooling, says Mr. Clark, saves one-third of the power cost and its reduced pressure lessens the number of service calls necessary for "frost backs," the lower pressure float valves causing no serious trouble.

Water cooling also reduces carbonization of oils, which means fewer plugged lines due to lower temperatures in the condensing unit.

In a 44-family apartment house, Mr. Clark reports, 12 air-cooled machines of ¼ hp. were replaced by two 1½-hp. water-cooled units, and the resultant drop in power load was so great that the utility sent inspectors out to verify the meter readings.

Operating costs of the refrigerating system were reduced 50 per cent, or an average of 60 cents per apartment per month. The savings paid for the change in equipment in 20 months, leaving a good economical system, fit for many years additional service. In buildings where systems are in very poor condition, Mr. Clark says, even greater savings may be effected.

Wheless Gambill Places Big Order with Crosley

CINCINNATI—Wheless Gambill Jr. of the Gambill Distributing Co., Nashville, Tenn., placed an order for 40 carloads of Crosley electric refrigerators, when he and eight Crosley dealers from Tennessee recently visited the Crosley factory here.

Dealers who accompanied Mr. Gambill were: R. A. Coleman, Sterchi Bros., Nashville; James Brown, Sterchi Bros., Chattanooga; Ben Bourne, Castner Knott Co., Nashville; Erle Hyde, Erle Hyde, Inc., Nashville; F. O. Harper, Shelbyville Harness Co., Shelbyville; J. R. Riley, Paris Radio Co., Paris; C. Q. Townsend, Terrel Electric Co., Chattanooga; and O. L. Smith, Chapman Drug Co., Knoxville.

Crosley Dealers Named in Wisconsin & Michigan

MENOMINEE, Mich. — Northern Hardware & Supply Co., Crosley distributor in this territory, has appointed a number of northern Michigan and Wisconsin dealers to handle Crosley Shelvador electric refrigerators.

Included in the list are Nash Radio Service, Tomahawk, Wis.; Muehl's Furniture Co., Shawno, Wis.; C. F. Schabich, Algoma, Wis.; Livington's Department Store, Merrill, Wis.; Nantell Electric Co., Escanaba, Mich.; J. L. Lipsett & Son, Sault Ste. Marie, Mich.; Vertin Bros., Calumet, Mich.; and Cloverland Supply Co., with stores at Iron River, Norway, Mass., and Amasa, Mich.

WHY IS IT THAT GUY IS ALWAYS HANGING AROUND HERE?
DON'T BE SUCH A FATHEAD! THE CHEAP INSULATION IN THAT BOX HAS THROWN ALL THE LOAD ON THE UNIT AND IS WEARING IT OUT!

The Ice Man was never like this!

It's playtime in the kitchen. Every Tuesday morning is open house in hundreds of American homes, when the refrigerator repair man can come and frolic as he may. It's getting to be an institution, this new game of fix the refrigerator. And it's played by many a winsome matron and well-intentioned repair man.

Heaven help us if we consider the full import of these clandestine meetings. Already the neighbors are talking. And such talk! It is too bad that reflections are cast at the gentleman in the case. For he is as innocent as the lady who so recently called him furtively on the telephone. It is naught but his duty, like a knight of old, to answer the lady's pleading and to struggle valiantly to aid the mechanism's plaintive call for help.

The culprit is the refrigerator itself. But is it reasonable that an honestly built unit should falter in but a few years of normal kitchen service? Ah, there's the rub! Has it been "normal"? The trouble in most cases, dear reader, is not with the unit, but with cheap insulation that has increasingly failed to stop heat from passing right through the walls into the food chamber. A vastly increased load has fallen on the unit and is wearing it out long before its reasonable life span.

The practical way to avoid this whole unpleasant problem is to use an insulation that will not get moist in the refrigerator wall. The Dry-Zero fiber is the only material that will stay dry in use. Dry-Zero gives efficient dependable heat-stopping protection for the whole life of the refrigerator. It leaves a minimum of work for the unit to perform, assuring its full life service.

Specifically, Dry-Zero will save on current costs from 30 cents a month when the cabinet is new to as much as $1.50.

If you are selling a Dry-Zero insulated refrigerator, you will find that the advantages this superior insulation gives can be used as one of your most convincing sales arguments.

Dry-Zero Corporation, Merchandise Mart, Chicago, Ill.
Canadian Office, 687 Broadview Ave., Toronto, Ontario.

DRY·ZERO
REG. U.S. PAT. OFF.
THE MOST EFFICIENT COMMERCIAL INSULANT KNOWN

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Published Every Week by
BUSINESS NEWS PUBLISHING CO.
5229 Cass Ave., Detroit, Mich. Telephone Columbia 4242.
Production Dept., 550 Maccabees Bldg., Columbia 4245.

Subscription Rates—U. S. and Possessions and all countries in the Pan-American Postal Union: $3.00 per year; 2 years for $5.00. Canada: $6.00 per year (due to special tariff). All Other Countries: $5.00 per year (U. S. Money) (See "Buyers Guide" columns for combination rates with the 1935 REFRIGERATION DIRECTORY AND MARKET DATA BOOK.) Notice: We employ no subscription agents or solicitors. Pay no money to strangers claiming to represent this company. Send orders and remittances direct by mail.

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VOL. 14, NO. 17, SERIAL NO. 318, APRIL 24, 1935

Air Conditioning Needs Good Merchandising

ENGINEERING problems weigh rather heavily on the minds of those who control the air-conditioning industry. That's nearly always true in a new industry; but seems to obtain especially in this one, for air conditioning apparently presents an unusually complex and entangled set of problems—problems which stubbornly resist orderly classification and systemization.

It is perhaps this preoccupation with technical enigmas which is one of the major reasons for the slowness with which the industry is gaining sales momentum. Not only is the buying public not susceptible, as a rule, to sales presentations requiring a slide rule and a highly specialized vocabulary to understand, but the open quarrels and violently divergent theories being promulgated by various competitors in the industry have served to confuse the issue in the minds of many prospects.

How It Came About

A couple of reasons may be assigned for this state of affairs. One is that some of the best and strongest of the manufacturers of air-conditioning products are primarily engineering organizations. They are accustomed to selling to other engineers and purchasing agents, rather than the public. The other is that when a sales executive who has been trained in specialty selling is brought into a responsible position in the air-conditioning picture, he is immediately confronted with the apparent necessity of educating himself with regard to a maze of advanced technical information—a problem he did not have, at least in so great a degree, with refrigerators, radios, or washing machines. He may become so wrapped up in these problems personally that assumes that the same problems are confronting the public and his sales organization.

To some observers it would seem that the problem of the air-conditioning sales manager is not so much to *explain* as it is to *simplify*. A story is told about Vice President R. H. Grant of General Motors when he was president of Delco-Light which illustrates the point. Mr. Grant was in session with a couple of advertising men, who were concerned with how to explain a farm-lighting plant. In the course of the talk, one of the men asked:

R. H. Grant Demonstrates the Idea

"But Mr. Grant, what about the storage battery?"

"Storage battery?" he deprecated. "There's nothing to a storage battery. All you do is put juice in, and take juice out."

Even though the storage battery at that time represented a very interesting engineering problem, it was all very straight and simple in Mr. Grant's mind. He was *selling* farm lighting plants—rather than making them a scientific oddity or engineering curiosity.

J. J. Donovan, manager of the General Electric air-conditioning department, recently said that there were two classes of prospective distributing organizations for air-conditioning products. One is the plumber or contractor type, which is "all back and no front." The other is the specialty sales organization, which is "all front and no back." He means, of course, that while the local heating contractor may have facilities for installing air-conditioning equipment, he has little or no talent for merchandising it; and whereas the specialty selling organization is ideal for pioneering new products, it has had no experience in the engineering intricacies which surround estimating and installing an air-conditioning job.

Oil Burner Industry's Mistake

Manufacturers of oil burners were confronted with a similar problem when they went out after the heating market and, to their later sorrow, chose the plumbing and heating type of sales outlet. To see how well they did with this type of distribution, all you have to do is glance at the astonishingly poor sales record of the oil burner industry during the last several years when electric refrigeration, sold by specialty organizations, was cometing over the industrial horizon.

The most successful air-conditioning dealers thus far have been those which were primarily specialty selling organizations, but which had the good sense to hire competent engineering staffs. While the executives concentrated on *selling,* the engineers have quietly gone about their task of solving each new installation problem, and of making accurate estimates which would permit profits without losing out in competitive bidding.

In other words, instead of trying to make a salesman out of an engineer, or vice versa, the successful idea seems to be that of getting a sales-minded dealer who can *hire* good engineers.

How to Sell Is Biggest Problem

As has been pointed out on this page before, the air-conditioning industry as a whole has neglected the problem of *how to sell* air-conditioning equipment. There is very little information, born out of experience, on the subject. All talents thus far have been devoted to technical elucidations, Hence it is that the NEWS receives letters like the following from men who are now in the air-conditioning business:

"After having taken advantage of your special offer for four copies of the ELECTRIC REFRIGERATION NEWS including the March 20 to April 10 issue, I have found them so full of pertinent, up-to-date, usable information that I am attaching, herewith, check for my annual subscription to this magazine.

"My business is that of promoting the sale of air-conditioning equipment in the Youngstown area, and I find that the NEWS is just full of ideas for people interested in airing one of America's newest industries.

"I am at present anxious to secure information on the following subjects:

"1. Methods used and success attained in the organization of air-conditioning dealers, with particular reference to minimizing the differences of quotations, which are so puzzling to prospective purchasers of air-conditioning equipment.

"2. Data relative to the staging of air-conditioning shows, with particular reference to methods used, length of time shows were held, type of people attending—that is whether by invitations or groups or open to the public, and general results obtained.

"I am familiar with a show of this kind which was held in the Cleveland Electric League auditorium last year.

"With the wealth of information at your disposal I trust that you can direct me to the proper people who can give me more information on the above subjects."

H. E. SUTTON,
Ohio Edison Co., Youngstown, Ohio.

ELECTRIC REFRIGERATION NEWS will continue to present a wealth of material on the experiences of air-conditioning dealers in devising and testing workable sales methods and formulae. This collection and evaluation of sales technique information, many observers believe, is one of the most important tasks facing the air-conditioning industry today.

LETTERS

Nema Not In on Macy Deal

Refrigeration Division
National Electrical Manufacturers Association
1106 Penobscot Bldg., Detroit
April 19, 1935.

Editor:

In the story on page 1 of your current issue, regarding R. H. Macy & Co., you state, "This agreement is said to have been promoted by the Nema group (Refrigeration Division of National Electrical Manufacturers Association)." I feel that the use of the word "Nema" in this connection is most unfortunate.

This organization has 17 member companies and I assure you that these manufacturers as a group had nothing whatever to do with any deal with Macy's. In fact one of the four large manufacturers mentioned in your article, has advised me that he knew nothing whatever about the arrangement described until it was substantially completed, and I am sure that the great majority of our members knew nothing whatever about it until they read your article.

Our organization is extremely careful at all times to avoid any joint action which could possibly be construed as price fixing or the enforced maintenance of resale prices. I am afraid that your article has the tendency to create the impression that some joint action contrary to this policy has recently been taken by the organization. I believe that erroneous impressions can be prevented in future if you will ascribe to Nema only such actions as are actually taken by us as a body.

HALDEMAN FINNIE,
Manager.

Not Merely Competitive

Burton Bigelow Organization
Merchandising Counsel
Bigelow Building
296 Delaware Ave., Buffalo

Editor:

Thanks for the kind word in connection with the Dayton Refrigerator Sales Coaching Course. All of my brilliance, however, is in my wife's name.

In your front page editorial, you speak of the fact that we are now in a stage of development where refrigerator selling is purely competitive, at least so the sales managers seem to think.

In my opinion, this is an error which every new industry makes for the first 10 to 15 years of its existence. After a certain saturation point is reached, the industry assumes that everybody wants a refrigerator. Suppose we agree with that. Everybody wants an automobile. Everybody wants a vacuum cleaner. Everybody wants a home.

The important point is—everybody cannot have all of these things and, if all the manufacturers of these devices are going to assume that the housewife wants them, they are going to miss a good percentage of sales.

Why? Because the fellow who builds up his sales presentation upon the wants of the housewife and develops these wants in a vivid manner, will walk away with the housewife's money, while the fellow who is comforting himself that she wants his refrigerator will be wondering why he doesn't sell more.

In the Dayton Sales Coaching Course we continually reiterate the fact that a woman must be made to feel the discomfort and inconvenience of her present situation as well as the comfort and convenience which result from the use of an electric refrigerator. Otherwise, it is our opinion that the scrap for the housewife's money will result in the automobile man, or the vacuum cleaner man getting a lot of money that otherwise would go to the refrigerator man.

BURTON BIGELOW.

He Misses Some Names

320 George St.
New Brunswick, N. J.

Editor:

Have enjoyed reading ELECTRIC REFRIGERATION NEWS and find it very helpful, and would like to know why the White Mountain or Sturtevant, as well as Carrier Engineering Corp. products, were not listed.

You may be interested to know that there is a concern in Philadelphia that makes parts for Frigidaire and Kelvinator. They also do rebuilding of coils and compressors. I recently had a 1-hp. Frigidaire water-cooled receiver-condenser repaired that had been frozen and they did a very good job.

It may interest you to know that we service any make of refrigerator and oil burner in our territory, domestic and commercial, and sell new and used commercial equipment.

FRANK R. BADER.

Binders for the News

Bourla Freres & Cie
Hezaren Caddesi, No. 1—3
Istanbul-Galata, Turkey

Editor:

A year ago you sent us a binder to accommodate the issues of ELECTRIC REFRIGERATION NEWS and which has proved exceedingly handy in allowing easy access and quick reference to the various issues of this newspaper.

Should you have any more of these binders available, we would appreciate it if you would kindly forward us another one to accommodate this year's issues.

If you will advise the cost of the binder, we shall hasten to make you our remittance in settlement.

BOURLA FRERES & CIE.

Answer: We have regular binders for the NEWS available at a cost of $3.75. The additional postage and transit charges for shipping such a binder to Turkey are $1.56. The total cost, therefore, will be $5.61.

Letter That Made a Sale

Bowman & Co.
10-16 South Hanover St., Carlisle, Pa.

Editor:

I have sold my Kelvinator agency to Bowman & Co. of Carlisle, Pa., and am acting as manager of the refrigerator department. I always wait each Friday with keen interest for the ELECTRIC REFRIGERATION NEWS and find it indispensable to anyone interested in refrigeration.

I want to tell you of a little incident which developed into a "lead" and finally into a sale of a Kelvinator. Last summer a lady by the name of Mrs. Sloop of Mt. Holly Springs, Pa. (a town about six miles from Carlisle), wrote in to you for specifications on Kelvinator and Grunow refrigerators. You published her request in the Letters Column of the NEWS.

I picked up the lead, brought her into the store and sold her an S. B. Kelvinator which amounted to a $239.50 sale. This lady was an entire stranger to me and I, of course, did not know she was in the market for a refrigerator.

W. E. ECKELS.

Statistical History

Ferro Enamel Corp.
Cleveland, Ohio

Editor:

Several days ago we wrote to the Refrigeration Division of the Nema association asking for a statistical history of the refrigeration industry. We received a letter from them April 2 stating that you edit an annual, and that the 1935 edition will shortly be off the press.

We would appreciate it very much if you would send us a copy of the 1935 REFRIGERATION DIRECTORY, regarding this letter as an order, sending the bill to the attention of the writer.

We wish to assure you that any figures quoted in our trade paper the *Enamelist* will be credited to ELECTRIC REFRIGERATION NEWS.

R. C. HARMON.

Unbiased Authority

Economy Refrigerator, Inc.
1155 Flatbush Ave., Brooklyn

Editor:

Enclosed herewith find our check for $.50 for which kindly send us five copies of ELECTRIC REFRIGERATION NEWS, dated March 20, 1935. The one which we want is the one showing specifications of the different makes of electric refrigerators.

We find this an invaluable sales help in comparing the various refrigerators to the public at large, as they accept your publication as an unbiased authority.

A. A. WILSON.

Printed on Horsehide?

Cline Electric Service
Fresno, Ohio

Editor:

Please find enclosed quarter for two issues of March 20 only. This issue should have been printed on horsehide to stand the constant checking on specifications. Keep up the good work.

CHAS. H. CLINE.

"Our check is enclosed for $1. Please send us promptly ten copies of the March 20 issue of ELECTRIC REFRIGERATION NEWS."

"You have a splendid trade publication, evidently backed up by a most alert staff and we await with keen interest each weekly issue."—William H. Day, Louisville, Ky.

"I have sold Frigidaires for seven years and enjoy reading your paper very much."—W. E. Atkinson, 2118 Pierce Ave., Nashville, Tenn.

"Please advise when our subscription to ELECTRIC REFRIGERATION NEWS expires, as we don't want to let it expire as we could not get along without it."—Moll Auto Supply Co., Stuttgart, Ark.

"I am no longer connected with the refrigeration industry but still enjoy your very good publication."—W. W. McCullough, 20 Fulton St., Akron, Ohio.

Sales Idea for the Week

By V. E. Vining, Manager of Department Store Sales, Westinghouse Electric & Mfg. Co.

I went into a store in New York to buy a red night gown for—my wife.

A supercilious clerk, with her nose trying to stick up far enough to hide the disgust in her eyes, assured me, "they are not being worn."

On the same errand, I went into a similar store in Rochester and was assured by a woman whom I'm sure "wrote the book" that a red night gown was in shockingly bad taste. She shuddered.

Then I tried in Detroit. Red pajamas, sure; night gowns pink, blue, flesh, white, black—you name it,—but red ones,—terrible!

It got to be a game with me. I tried to buy that nighty in every city across the continent. I received more advice than Mr. Pink has pills. I became America's best posted man on hot nighties that don't keep the cold out—but I didn't get my red nighty.

Then a little old lady in a store in Little Rock hung one all over me. And How!

Says she, "I'm sorry I haven't a *red* nighty in stock, but I know just what you want—just the idea you have in mind."

"You've a wife, I bet, who is different, and you want something different for her."

Did I love it? Listen mister, hooey won't make the wheels go 'round! But it's the world's best known lubricant.

Then she went to the back of the store and reappeared carrying a sheer thing in her loving arms as if it were her only child and she never wanted to part with it.

Her eyes beamed as she held it out and let me touch it—gently. The look on her face told me a million silk worms, under her personal direction, had copied the pattern of a spider's web, that my wife might be sheathed in a proper setting.

She didn't say 20 words,—but she looked volumes of songs by Irving Berlin. She breathed romance, understanding, pride of possession, and a flattering confidence in my sense of appreciation. She even understood that a fat man interested in confectionary lingerie might not necessarily be Public Enemy Number One.

And did I buy? You guess.

Standard Statistics Bulletin Predicts Good Year for Refrigerator Firms

NEW YORK CITY—With the improvement in wages and business conditions which has developed since early 1933, the public has been prompted to resume the buying of semi-luxuries and since prices of electrical appliances have compared favorably with other items in this category, these lines have been among the principal beneficiaries of the renewed spending, says the current "Household Products and Supplies" issue of *Standard Trade and Securities* published by Standard Statistics Co., Inc.

"The beneficial influence of federal measures on consumer spending is expected to continue throughout the current year," says the bulletin. "In fact, it is not believed that demand for most products would be appreciably lessened by the additional price increases already justified by higher production costs. The institution of such advances, however, is not a certainty; upward adjustments in many lines will be prevented or held to moderate proportions by severe trade competition.

"In these conditions lies the explanation of the sales records established by mechanical refrigerators and washing machines during 1934, as well as the creditable outputs of other appliances.

"The favorable volumes thus far this year indicate that the force of the constructive tendencies has not yet been diminished. Household electric refrigerator sales for January and February were nearly double those a year earlier.

"The impressive showing of refrigerator manufacturers is the result of the seasonal inactivity of the winter months and the earlier commencement of sales drives; it cannot be accepted as a criterion of gains likely to be witnessed in the remainder of the year. A continuance of sales above 1934, however, is indicated for the majority of appliance lines."

In its section on "Outlook for Household Products Securities" the bulletin discusses two manufacturers of household electric refrigerators: Kelvinator and Servel.

With respect to Kelvinator the bulletin has the following to say:

"A deficit equal to $0.26 a share was reported for the initial fiscal quarter, ended Dec. 31, 1934, which compares with a loss equal to $0.30 a share in the like period a year earlier.

"A deficit is a normal seasonal occurrence during the company's first quarter, and there is a good possibility that the company may show a slight profit for the first half of the current fiscal year, as compared with a share deficit of $0.03 in the corresponding 1933-1934 interval.

"Field stocks are in a satisfactory condition, retail sales are running ahead of those a year ago, price maintenance is anticipated and full year earnings should exceed those for the past fiscal period.

"A sharp improvement in air-conditioning operations is materializing, although a profit from this source is not anticipated during 1935.

"An extra dividend of $0.20 was disbursed on Jan. 2, 1935, and in view of the improved financial position and wide coverage of the existing rate, the regular dividend may be increased this year."

The following is the report on Servel, Inc.:

"Unit sales thus far in the current fiscal year have run well ahead of the corresponding 1933-1934 period, and profit margins are understood to have remained relatively satisfactory.

"Price structures should continue to be well maintained over early future months and indications are that returns for the current fiscal year will be well above the $0.27 a share reported for the 12 months ended Oct. 31, 1934.

"The market for the company's products has been considerably widened, particularly in the western natural gas territories, with the perfection of the new air-cooled Electrolux. A kerosene-operated model has been developed for use in rural sections.

"While sales volumes in the less active truck body and commercial electric refrigeration divisions are small, these also are profitable. In view of the generally favorable outlook, the strong financial position and the elimination of accumulated preferred dividends, payments on the common are possible this year."

3 More Crosley Dealers Appointed in Utah

SALT LAKE CITY—Western Supply Co., Crosley distributor here, has appointed three more dealers in Utah to handle the Crosley Shelvador line, announces L. R. Holden, assistant manager of the company.

The new dealers are Z. C. M. I., Salt Lake City, with I. F. Christensen in charge of the refrigerator department; Southwest Furniture Co., Provo, with Arch White in charge; and Sterling Furniture Co., Ogden, with F. A. Madsen in charge.

Claims of Majestic Creditors Due June 3

CHICAGO—Sitting in the case of the Grigsby-Grunow Co., former manufacturer of Majestic electric refrigerators and radios, Referee-in-Bankruptcy Wallace Smith last week ordered all creditors who have not yet filed their claims with the defunct company's receivers to do so before June 3, or be barred from further action in them.

Dwight Brothers Paper Co. and other creditors of the Grigsby-Grunow Co. recently lost a Supreme Court effort to have the company declared bankrupt, the court refusing to review the action of the lower Federal Court in Illinois, which had previously refused to take the action requested by the creditors.

Ice Monopoly Charged In California

SACRAMENTO, Calif.—A charge that an ice monopoly exists in California and that a conspiracy is under way to raise the price of ice was made in the California State Assembly recently by Fred Reaves.

Mr. Reaves introduced a resolution asking for the appointment of an assembly committee of five members to investigate conditions.

Bacharach to Organize Appliance Dept.

HACKENSACK, N. J.—E. M. Bacharach, formerly appliance manager of Kresge Department Store in Newark, recently joined the staff of H. Plager & Sons, furniture store here. Mr. Bacharach will organize and merchandise a home appliance division.

Temprite Feature Series (No. 5)

VOLUME WITH PROFIT

TEMPRITE Beer Cooling Units preserve the quality of the beer dispensed through them thereby increasing the demand. Furthermore, they eliminate waste in handling thereby increasing the profit per glass.

TEMPRITE 80° 40° INSTANTANEOUS

Refrigeration Distributors

Temprite Beer, Water and Beverage Coolers have achieved outstanding success in the field. We shall be glad to furnish you with complete information.

TEMPRITE PRODUCTS CORPORATION
(Formerly Liquid Cooler Corp.)
"Originators of Instantaneous Liquid Cooling Devices
Detroit - - - - - - Michigan

We ask for no higher tribute to our manufacturing ability than to have people say, "Universal Cooler products are good products—you can always depend upon them". It is gratifying to us to hear how generally this sentiment is expressed.

UNIVERSAL COOLER CORPORATION
DETROIT, MICHIGAN BRANTFORD, ONTARIO

MANUFACTURERS OF A COMPLETE LINE OF HOUSEHOLD AND COMMERCIAL REFRIGERATION EQUIPMENT

AIR CONDITIONING

Room & Duct Type Conditioners to Be Used To Cool Gulf States Life Building

DALLAS—Installation of air-conditioning equipment is one of the principal features of the program of modernization and improvement of the Gulf States Life Building here, which is the largest building in the southwest to be completely, or nearly completely, air conditioned.

General Electric air-conditioning equipment, purchased from the Electric Household Appliances, Inc., G-E air-conditioning dealer in Dallas, is being installed by the Wallace Plumbing Co. of this city.

All but two of the 16 floors are to be air conditioned. All floors above the fourth will utilize G-E room air conditioners, with some modification from standard construction. The second and third floors will have duct systems connected to central plant air conditioners designed and built by the General Electric Co.

Circulating water from the basement will be pumped to the coils of the room and central plant conditioners. A G-E Freon compressor in the basement will be used for refrigerating the water for summer cooling. In winter the same pipes and coils will carry hot water for heating.

The room air conditioners for the upper 12 floors are being modified to meet requirements of the application. The humidifiers and heating coils are removed, and both cold and hat water are circulated through the cooling coils. The fans are speeded up to increase the air flow and minimize the effect of variations of wind pressure on the exterior of the building. Control of each unit will be manual by means of a radiator valve in the supply line.

To avoid building up pressure in the rooms and thus cut down the ventilation air flow, air from the rooms will be discharged into the corridor and removed by a corridor exhaust system on each floor, with its total air flow equal to the rated ventilation capacity of all the units on that floor.

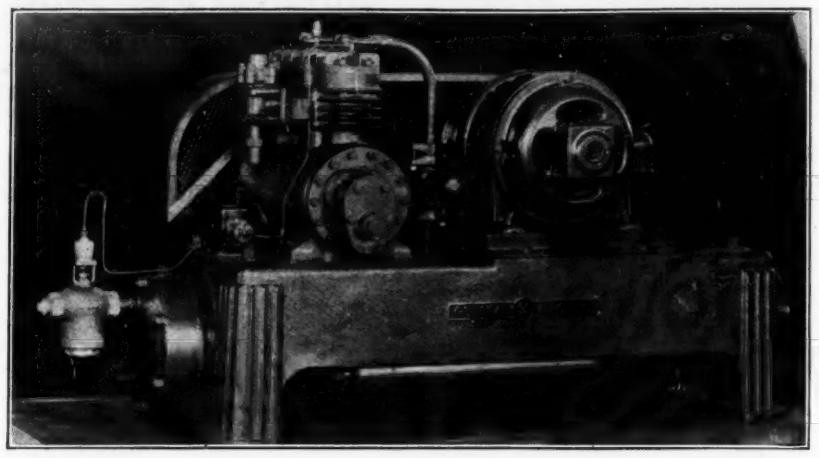
In addition to the installation of air conditioning in the Gulf States Building, six floors are being added to the structure's original 10 stories. The building is of steel construction, with stone, terra cotta, and brick exterior.

York to Condition Air In Government Building

WASHINGTON, D. C.—Complete year-'round air conditioning of the United States Department of Interior building is to be installed by York Ice Machinery Corp., York, Pa., reports S. E. Lauer, general sales manager of the York organization.

Equipment, which must be installed within 150 days, is to supply 500,000 cu. ft. of conditioned air per minute.

For Comfort Cooling Installations



Type CM-9-L condensing unit (10-hp. size) in G-E's new line of machines for air conditioning. The unit has the new shell-and-tube condenser-receiver assembly.

Receiver, Condenser Combined on G-E's Freon Machines

(*Concluded from Page 1, Column 1*)

tively, have rated refrigerating capacities of 1.8 tons, 3.6 tons, and 5.7 tons.

Type CM-81L, 5 hp., is rated at 5.7 tons.

Type CM-9L is available in two sizes: 7½ and 10 hp. with respective rated refrigerating capacities of 8.75 and 11.5 tons.

Type CM-10L is also obtainable in two sizes: 15 and 20 hp., rated at 16.5 tons and 21.5 tons.

Outstanding feature of the "L" units is their shell-and-tube condenser-receivers which combine the functions of condenser and liquid receiver.

Seamless steel water tubes are used in these units, galvanized against corrosion and providing straight accessible passages for cleaning. The tubes are finned on the refrigerant side for high heat-transfer efficiency, and are of a size providing low pressure drop for cooling tower or city-water service.

The readily removable heads give quick access to the tubes for cleaning purposes, and the condenser assembly is capable of withstanding 2,000 pounds per square inch pressure.

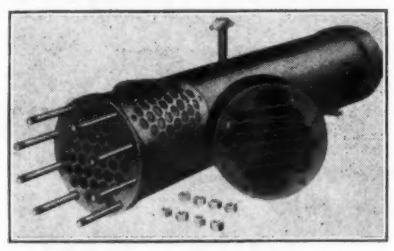
As further assurance of quiet, vibrationless operation, the heavier "L" units are provided with heavy, one-piece, cast-iron bases. Types CM-9L and CM-10L have pressure lubrication to take care of the heavier moving parts of these units.

Valve plates are of an improved compact design abetting quiet valve operation.

All of the new units are obtainable with several different motor and motor starter combinations, d.c. and a.c. to make them readily adaptable to the user's requirements.

Standard and "quiet" motors are available; and two-speed motors can be had on condensing units of 5 hp. and larger which, together with manual or automatic control, provide greater operating efficiency where the cooling load varies widely.

Condenser Assembly



Condenser assembly (shown with head removed) for General Electric condensing unit model CM-9-L designed for air-conditioning applications.

1,078 Attend 9 Timken Dealer Meetings

DETROIT — Attendance at recent regional conventions held by the Timken Silent Automatic Co. in nine eastern and midwestern cities totaled 1,078 dealers and salesmen, factory officials report.

Cities on the schedule were: Baltimore, Philadelphia, New York City, Boston, Utica, Detroit, Chicago, Minneapolis, and Des Moines.

Feature of the programs was an analysis of the new Timken oil burning water heater by M. J. Cosgrove, manager of Timken's water heater division. Other speakers on the program included:

Willard F. Rockwell, Timken president; M. J. Roberts, Timken general manager; J. L. Lambin, representing Timken's advertising agency; Rev. Lex Souter of Fall River, Mass., guest speaker who talked on "The Man Behind the Sale."

Penn Switch Transfers Maire to Chicago

DES MOINES—E. B. Maire, sales engineer for the Penn Electric Switch Co. of this city, has been transferred to the Chicago office of the company, Nelson Delavan, sales manager reported recently.

Joe Linfor, sales engineer, has been assigned to the Detroit office, which is in charge of Paul Penn.

Air Cooling Gains in Two Eastern Cities

(*Concluded from Page 1, Column 3*)

number of air-conditioned eating houses in the city to 16.

A system of 28 hp. was also installed during 1934 in a printing establishment, and another, of similar size, in one of the city's hospitals.

Bowlers were also assured of being able to follow their sport in year-'round comfort when one of the city's alleys installed a system of 3 hp.

In the residential field, installations registered no increase, but managed to hold their own with the totals for previous years. Nine systems with a total of 12 hp. were reported last year, against six, of 15 total hp., in 1933, and nine, of 26½ hp., in all years previous.

The following tables show that, while the number of installations in each city has increased, the average size of systems installed has been reduced considerably in the last two years. This is true of practically all of the cities studied by ELECTRIC REFRIGERATION NEWS in its nation-wide survey of air-conditioning activities.

Baltimore figures are given in the first table, and those for Washington, D. C., in the one following.

	No. of Installations	Total Connected Hp.	Average Hp. Per Installation
Before 1934	73	3,626	49.67
During 1934	74	1,973	26.66
Before 1933	42	3,765¾	87.52
During 1933	37	493	13.32
During 1934	62	1,645¾	26.55

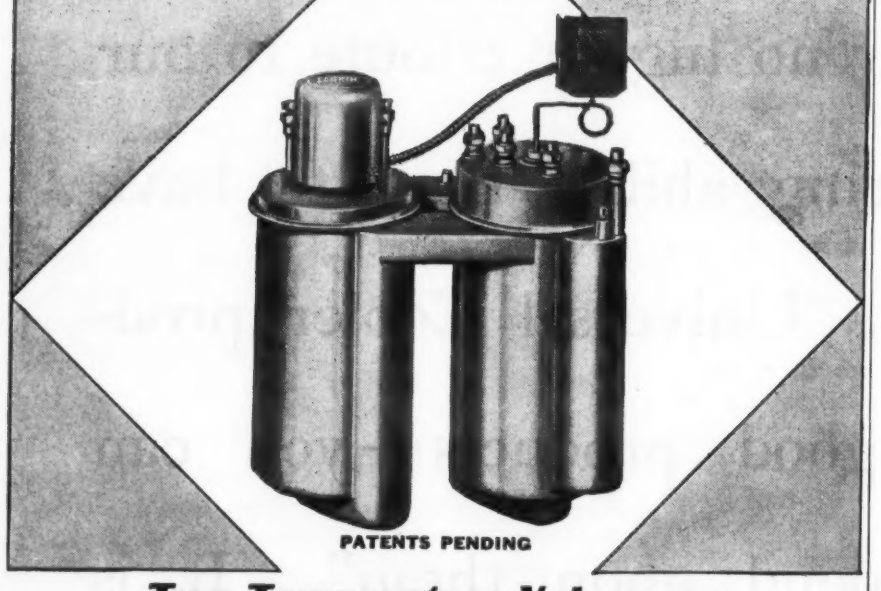
Washington Air-Conditioning Systems

Type of Establishment	Prior to 1933 No.	Prior to 1933 Hp.	During 1933 No.	During 1933 Hp.	During 1934 No.	During 1934 Hp.	Total Thru 1934 No.	Total Thru 1934 Hp.
Bakeries	4	46½	..	..	..	..	4	46½
Stores	2	164¼	6	196½	20	500	28	860¾
Beauty Shops	1	1½	..	..	1	11½	2	13
Bowling Alleys	..	..	..	..	1	3	1	3
Candy Manufacturing	..	..	1	3	..	..	1	3
Churches	..	..	1	48	..	..	1	48
Exhibits and Displays	1	1¼	5	20	..	..	6	21¼
Funeral Parlors	..	..	1	15	..	..	1	15
Government Buildings	6	230	9	200	22	14,222½	37	14,652½
Hospitals	1	90	..	..	1	28	2	118
Hotel Dining Rooms and Coffee Shops	1	465	3	41½	6	204½	10	711
Hotel Guest Rooms	..	..	..	..	1	51	1	51
Libraries	1	28	..	..	..	..	1	28
Market Spaces	2	3	..	..	..	..	2	3
Meat Processing	1	16½	..	..	..	..	1	16½
Office Buildings	2	660	..	..	1	422½	3	1,082½
Opticians	..	..	1	2	..	..	1	2
Printing	1	62	..	..	1	28	2	90
Private Offices	2	7	5	11	10	25¼	17	43¼
Radio Studios	..	..	1	10	..	..	1	10
Residences	9	26½	6	15	9	12	24	53½
Restaurants	9	162¼	7	131	10	360	26	653¼
Theaters	5	2,032	..	..	..	..	5	2,032
Totals	**48**	**3,995¾**	**46**	**693**	**83**	**15,868¼**	**177**	**20,557**

Baltimore Air-Conditioning Systems

Type of Establishment	Prior to 1933 No.	Prior to 1933 Hp.	During 1933 No.	During 1933 Hp.	During 1934 No.	During 1934 Hp.	Total Thru 1934 No.	Total Thru 1934 Hp.
Barber Shops, Beauty Parlors	..	..	2	2	3	37	5	39
Drug Stores, Confectioneries	..	..	2	15	4	80	6	95
Department Stores	1	165	..	..	6	723	7	888
Food Stores	..	..	..	..	5	20	5	20
Public Buildings	1	327	1	13	2	60	4	400
Hospitals	1	20	1	3	2	24	4	47
Industrial	5	412	4	82	..	..	9	494
Restaurants	7	95	3	99	8	116	18	310
Offices	3	26	10	31	13	163	26	220
Banking Institutions	5	463	3	15	..	..	8	478
Residential	3	8	5	10	6	6	14	24
Apparel Shops	..	..	3	9	9	109	12	118
Theaters	7	1,643	2	103	12	612	21	2,358
Miscellaneous	2	52	1	15	4	23	7	90
Totals	**35**	**3,211**	**37**	**397**	**74**	**1,973**	**146**	**5,581**

ON MULTIPLE INSTALLATIONS



PATENTS PENDING

Two Temperature Valves are Not Needed with the

LARKIN DUAL-CONTROL LIQUID COOLER

Easily Cleaned · Dual-Control · Cold-Hold · Flexible

● Installation is a simple matter with the LARKIN. It can be placed in the same refrigerating system used for cooling a refrigerator or for making ice cubes—*without the use of two temperature valves.*

This is because the LARKIN employs brine circulation. Due to the exclusive Dual-Control, the temperature of the brine governs compressor operation, and a thermostatically actuated switch in the beer coil compartment side, controls the brine circulation. Regardless of how cold the brine may become in the refrigerating side of the cooler, the beer coils can not become too cold, because brine is circulated, only according to the load demand on the beer coils. The LARKIN does not disturb and thus preserves the brewed-in flavor.

For cooling beer, water, root beer, carbonated water, orange juice, milk, etc. For saloons, taverns, hotels, restaurants and factories.

No refrigeration salesman can afford to miss the important sales facts in this folder. It's yours for the asking.

LARKIN REFRIGERATING CORPORATION

102 Fifth Ave. NEW YORK, N. Y. · ATLANTA · 325 S. California Ave. CHICAGO, ILL.

Cold Control—Foam Control

Just a string of fittings . . .

That's all! But these little pieces of hot forged brass and extruded rod must resist tremendous operative pressures; they must make up into perfectly tight joints and must, at all times, be completely "Seepage-Proof".

While fittings cost very little per piece, their responsibility is great, and it is no wonder that engineers are quite careful in specifying their source of supply, because experienced men know that fittings have a great deal to do with the ultimate satisfaction with any job, large or small.

It is for this reason that leaders in the industry specify Commonwealth Seepage-Proof Fittings, . the fittings "Built Right to Stay Tight".

Made in every wanted standard size and in hundreds of semi-standard combinations of pipe and tube ends. Special fittings made very extensively. Send us sample, blue print, or sketch for prompt quotation.

COMMONWEALTH BRASS CORPORATION

Commonwealth Ave. at G. T. R. R.

DETROIT, MICHIGAN

N.Y. Dealers Employ Cooperative Meetings to 'Put Public Right' On Air Conditioning

NEW YORK CITY—To dispel misinformation with regard to air conditioning, manufacturer members of the Electrical Association in this city—Frigidaire, General Electric, Kelvinator, and Westinghouse—held a series of meetings of prospects, architects, building owners, rental agents, etc. in the association's auditorium during the winter months, reports Edward J. Hegarty, Westinghouse Electric & Mfg. Co.

"Air conditioning is new to the public," says Mr. Hegarty. "Stories are written with screaming heads—'Our Next Great Industry.' Press agents release propoganda on prices that are ridiculously low; contractors talk loosely. Executives, shop-keepers, building owners and householders read and wonder 'What will it do for me?'

Rumors About Costs

"There are stories," he continues, "that the installation cost is high; that the equipment costs too much to operate; that on one job the estimates were from twice the cost stated in the lowest bid; that the such-and-such company (always a well-known name) bought an air-conditioning installation that did not live up to promises. The prospective buyer finds it all very difficult and confusing."

This situation, Mr. Hagerty says, led air-conditioning manufacturer members of the association to ask "Why couldn't a group of prospects, office building owners for instance, be brought together for a fair and impartial discussion of air conditioning as it affected their interests?"

Subjects of Interest to Audience

"Groups to be invited were selected and a program plan was worked out. The message was to be one from the industry. While the speaker would be a representative of one manufacturer, he would not present the views of his own company or his company's engineers. Apparatus would be discussed in relation to what it did, and not in connection with its technical details or points of superiority."

At each meeting, according to Mr. Hegarty, the subject was discussed from the angle of audience interest. First meeting was for architects, the second for building owners and rental agents. Subsequent meetings were held for physicians and surgeons, women's-wear owners, restaurant owners, beauty parlor owners, and men's clothing shop owners.

Tickets Sent on Request

"The original invitation," says Mr. Hegarty, "went to the prospect in a letter from the association. Those wanting to come were asked to request tickets. Tickets were used so that some idea of attendance could be gained.

"On the day before the meeting a postcard reminder was sent to those who had asked for tickets. About 60 per cent of the tickets sent out were turned in at the door.

Prospects Are Invited

"Each manufacturer," he states, followed the association's letter with one to his individual prospects; and the electric light company mailed invitations to its customers. Business-paper editors were invited and the trade associations of the industry were informed.

"The letter or invitation from the association was in most cases so worded that the prospect knew that he would not be solicited by salesmen if he attended."

Typical Invitation

A typical letter of invitation is as follows:

"Doctor Richard Roe
New York, N. Y.
Dear Doctor:

"AIR CONDITIONING FOR THE PHYSICIAN AND SURGEON

"Will be the subject of a meeting sponsored by this association at its Electrical Institute, seventh floor, Grand Central Palace, 480 Lexington Avenue, New York, on December 12th at 8:15 p. m.

"The program is designed to give practical facts on the value of air conditioning from the standpoint of its physiological effect upon patients and its comfort to them.

"The speaker, Mr. Louis Levine, well-known air-conditioning engineer, is an authority on the subject under discussion. He will not present the views of one manufacturer or group of engineers, but the concensus of the best thought of the air-conditioning industry.

"Mr. Levine will attempt to answer such questions as his audience may wish to have answered following his address. If you have any questions on the subject now, send them in. They will be answered during and as part of his address. There will be no sales solicitation at his meeting.

"Admission will be by ticket. If you want to attend, just fill in the coupon below and return this letter to us. We will then send tickets.

Very truly yours,
J. J. Donovan, Chairman,
Air Conditioning Sub-Committee
Power Division, Industry Program Committee."

"Each meeting," Mr. Hegarty points out, "followed the same pattern. First a chairman explained the idea behind the meetings; second, a speaker talked for forty minutes on the subject and third, there was a question-and-answer forum.

Pool Information

"In preparing his talk, the speaker of the evening conferred with the representatives of the other manufacturers. Information and illustrations showing installations were supplied by all, pooled and the best of the lot used. Each main talk was laid out over a plan. First, the audience was told what air conditioning was, how air could be cooled in summer and then dehumidified, how it could be washed and circulated and filtered. Then the various types of systems available were discussed.

"From here the speaker went into actual installations showing photographs of jobs, telling why they were installed as they were and then giving costs on the installation. When he was finished the audience had a fair, common-sense idea of what air-conditioning could and could not do for that industry.

Talks Given to Salesmen

"These talks in processed form," Mr. Hegarty concluded, "were made available to the salesmen of the member manufacturers. Armed with such a talk the man could say, 'This is not what my boss, or my engineers say—this is the thought of the industry.'"

Questions asked in the open forum, Mr. Hegarty stated, brought out a number of points in connection with the equipment which helped shape future meetings and gave ideas for advertising copy and sales presentations.

McConnell Explains Need for Air Filters

BOSTON—In his talk on "Air Cleaning—The First Step in Air Conditioning," delivered before the March meeting of the Air Conditioning Bureau of Boston, J. R. McConnell of the American Air Filter Co., Louisville, declared there was too much "ballyhoo" and not enough common sense in air conditioning at present.

"To fully appreciate the vital need for cleaning air and to understand the function of air-cleaning equipment in the modern air-conditioning system," stated Mr. McConnell, "it is essential to know something about the physical characteristics of air-borne impurities called dust.

"All air contains dust. Even in sections remote from civilization and at the highest altitude man has been able to reach, atmospheric dust is found in appreciable quantities. The size, variety, and volume of these dust particles is almost beyond the conception of the human mind.

"All dust is objectionable, but soot is particularly harmful, not only from the standpoint of cleanliness within a building, but for its detrimental effect upon the equipment. It was the necessity for eliminating soot and other carbon that brought about the present practice of cleaning air by filtration.

"There are three basic forms—the plane and round surfaces, and the streamline shape for air filter baffles. All media are some variation from these. Their relative resistance," stated Mr. McConnell, "would seem to indicate that the streamline form is the ideal shape for this service—which is true as far as resistance is concerned. But other factors limit its use in air filtration."

The three basic characteristics of an air cleaner according to Mr. McConnell, are efficiency in dust removal, resistance to air flow, and dust holding capacity.

"Comparing the performance characteristics of a surface filter with a viscous filter, both having the same rate capacity," he continued, "we see that all filters are by no means equal. Automatic filters offer the advantage of a constant unvarying air supply with minimum of attention.

"They have a practical and economical solution to the problem of cleaning large volumes of air," Mr. McConnell concluded, "but first cost precludes their use on small installations of less than 5,000 c.f.m., except in special cases."

Diners at the Highland Hotel in Springfield, Massachusetts, are comfortable in the hottest weather, thanks to a "Freon" air conditioning system installed by Frigidaire Corporation.

Sell a restaurant "FREON" AIR-CONDITIONING and you've sold it . . .

MORE CUSTOMERS
BETTER SERVICE
TASTIER MEALS
LARGER CHECKS

Summer business doubled after a 20-ton "Freon" air-conditioning system was installed by Westinghouse in the attractive French Village Restaurant, Louisville, Kentucky.

At Damon's in Shaker Heights, Cleveland, Ohio, General Electric installed a "Freon" air-conditioning unit.

In the Black Cat Restaurant, St. Louis, Missouri, more customers, large checks and greater profits are the result of the "Freon" air-conditioning system installed by Servel, Inc., Evansville, Ind.

Longchamps Restaurant, in New York City, is especially popular since York Ice Machinery Corporation installed "Freon" air-conditioning.

ASK any restaurant owner who has installed air-conditioning equipment what he thinks of it, and he'll say something like this:

"Before I put in air-conditioning, my summer trade fell off something *awful*. Seems that people don't feel like eating when the weather gets hot. And the way they kept complaining about the least little thing!

"But, oh boy, what a difference air-conditioning has made in my place! Why, last summer I more than doubled my profits over the summer before. People came from 'way down town just to eat lunch where they could be comfortable. They said the food tasted better, the service had improved 100%, and they actually ate more, so that the checks were bigger. Believe me, I'd never try to run a restaurant without 'Freon' air-conditioning again!"

Hotels and restaurants are among your most logical prospects for air-conditioning installations. Be sure to call on them regularly. Tell them what it's costing them to be *without* air-conditioning. And point out that it is imperative to use "Freon," the safe refrigerant. Explain that it's non-toxic, non-flammable, and odorless when mixed with air up to 20% by volume.

That's what makes "Freon" the most exclusively used refrigerant for air-conditioning of office buildings, hotels, railroad trains, apartments, theatres—and in air-conditioning and refrigeration of meat markets, delicatessens, florists' shops, fur stores, homes, libraries, museums and many other places.

KINETIC
REG. U. S. PAT. OFF.
FREON
REG. U. S. PAT. OFF.
a safe refrigerant

KINETIC CHEMICALS, INC., TENTH AND MARKET STREETS, WILMINGTON, DELAWARE

AIR CONDITIONING

Medical Authority Explains How Air Conditioning Will Raise Health & Living Standards

INDOOR atmospheric control—air conditioning—is envisualized as the means by which the people of the earth may improve their health, their business prosperity, and their enjoyment of life, by Clarence A. Mills in the book "Living With the Weather," published by the Caxton Press in Cincinnati. The author is a doctor of medicine and a doctor of philosophy, and is professor of experimental Medicine at the University of Cincinnati. His interest in climatic and weather effects was first aroused during a two years' stay in China under the Rockefeller Foundation (1926-1928).

Since then he has spent a major portion of his time in this study, using clinical material and collecting statistics in America and Europe.

Mr. Mills will be remembered by air-conditioning engineers as the man who made the interesting talk on the effects of various types of climates on different types of diseases at the winter meeting of the American Society of Heating and Ventilating Engineers last year.

Correct Faults in Weather

The author in his new book points to air conditioning as the means for correcting faults in living and working habits brought about by weather conditions. In the temperate zones, with its many stormy periods and quick changes in weather presenting a highly stimulating effect, the individual is likely to "burn out" within a short period of years unless he can obtain full benefits from his periods of relaxation, says Dr. Mills.

Proper indoor atmospheric control betters his opportunities for proper rest and relaxation, Dr. Mills shows in his book.

Cooling Needed in South

In contrast to the stimulating effect of the temperate zones, the climate in tropical and semi-tropical areas produces a depressing effect which leads to inactivity and low vitality. Indoor cooling is the chief corrective device for this condition, Dr. Mills declares.

Says Dr. Mills, with respect to the invigorating effect of the climate in the Northern part of the United States :

"High body vigor is matched by a similar dynamic state in the nervous system, and leads to the restlessness so prevalent in the Northern states. The ambitious urge, induced by this climatic drive, leads people only too often beyond their bodily or mental capacity.

"Activity of all kinds goes on too intensely. It is in these most stimulating regions that bodily and mental breakdown are increasing most rapidly.

"Many people feel that it is the pace of the life about them that is at fault, that it is modern civilization which has developed too great an acceleration. Rather it would seem that the restless vigor of individuals here, multiplies by the millions of population, is responsible for the speed of life round about. Each individual is affected just as he takes part in accelerating the pace.

Partial Relief

"Nor does it seem that he could slow down if he so desired. The climatic urging, affecting as it does the basic factors of our existence, would appear to be an inexorable force beyond the power of individual control.

"This is not really true, however, for we *can control our indoor weather quite satisfactorily now, and have at our command a means of partial relief from too excessive stimulation.*"

According to Dr. Mills, there is in South America in the Andes highlands—an area where the temperature at all times remains within the best range for human activity. Although lying directly across the equator, there is no debilitating heat on account of the altitude. The night cooling and mountain influence make for a climate that is mildly stimulating without being exhaustive.

Effect on Health and Activity

What can be done about the effect of weather on human health or activity? Dr. Mills seems to think intelligent application of air conditioning provides the answer. Quoting from his book:

"The driving force of the weather can be lessened by more intelligent control of indoor environment. Air conditioning offers the means of such control, but we need more specific information on weather effects and just what environmental conditions are best for man in the long run.

"We must know what level of stimulation is best, not for a year or a generation, but for a thousand years. Almost certainly our American weather needs much toning down, especially in its effects on the nervous system."

Frequently, the author points out in discussing weather effects on the American people, the remark is made that it cannot be this that is responsible for our pep and vigor—how can it be when we live in an indoor sub-tropical climate most of the time? With our houses, offices, and public buildings kept at 70-75° F. all winter, and with only an hour or two a day spent out-doors, how can the weather affect us much?

What does it matter, some people argue, if a 50-80° F. drop in temperature sweeps down out of the northwest every week or so, if we are snug and warm inside? Why blame the storms of winter if they seldom reach our bodies?

Bedrooms Too Cold

"One important point, however, is overlooked," asserts Dr. Mills. "Storm changes come only every four to six days in winter, but we artificially produce just as marked a temperature every night. We live during our waking hours at 70° F., then at night throw open our windows, turn off the heat, and breathe cold night air while we sleep.

"Probably the average winter drop in temperature each night in northern bedrooms would be found to be in the neighborhood of 50° F. True enough our body surface is not often chilled by this air, but we do breathe it into our lungs where chilling takes place and body combustion is stimulated by the rapid loss of heat.

"It has been shown on animals that eight hours cooling each day (25° F. drop) produces a maximum stimulating effect on energy level. So here we are, deluding ourselves into believing we are protecting ourselves against climatic effects when really we are greatly intensifying them by our fetish for open air sleeping.

Intensifies 'Climatic Drive'

"In Europe buildings are kept at about 10° F. lower temperature than in America, and in addition, night ventilation is less extreme. The result is a more moderate daily temperature range and lesser stimulation.

"It is amazing the many different ways in which we Americans have unwillingly intensified the great driving force of the weather. We have had imposed upon us the most stimulating climatic drive the earth has to offer, and then have added to its vigors by an over-use of caffeine and a craze for open-air sleeping.

"We hear everywhere today about air conditioning and controlled indoor atmosphere, yet at night we discard all our protection when we open wide the windows.

"Perhaps there was some virtue after all in the old time dread of night air. It now seems likely, at any rate, that another few years will see people of the North opening their windows less wide, and giving some thought to this over-stimulation that open-air sleeping brings during the winter months.

"Scientific studies indicate that a night drop of about 25° F. is probably best for healthful existence in the long run. Drops far in excess of this are too stimulating and add much to the physical and nervous tension of life.

25° F. Drop for Night Cooling

"In the South, and throughout the tropic and Orient, the situation is quite different. There, it is the summer months that call for indoor air conditioning—cooling, of course, instead of heating. But again the principle of the 25° F. daily drop will probably be found best for health, with the coiling applied to the sleeping quarters.

"Too sudden cooling or actual chilling, is dangerous for people of the warmer regions where body heat production is sluggish. They are very susceptible to respiratory infections, to colds, pneumonia, and tuberculosis when chilled, so that it should never be overdone. If carried out properly, the energy level of the people, their vigor and vitality, could be raised more nearly to par with that of people from more stimulating regions."

Dr. Mills explains why some people are chilled and others uncomfortably warm at the same temperature.

The basic differences behind the varying temperature needs for comfort in people are due to differences in actual metabolic level.

Differences in People

The person who chills easily has low body fires and simply cannot quickly flare up to meet lower air temperatures. A high degree of combustion activity in the body renders external heat disagreeable and such people prefer indoor temperatures below 70° F. and glory in the out-door cold of frigid weather.

"There is no point in differing over this matter of comfort temperature, for the individual cannot stimulate or smother his inner fires at will," says Dr. Mills. "Give grandmother her corner near the radiator and let Bob do his home work in the coolest spot he can find.

"What must be realized is that not all people of a group need the same air temperature level, that 75° F. will for some be very depressing while for others it will be none too high.

"People with chronic infection, particularly of the nasal sinuses, throat or bronchi, are particularly susceptible to chilling, and need a higher room temperature with freedom from drafts. Persons developing a 'cold' also chill easily and need extra protection.

"Attention should be paid to these individual differences in seating children in a school room, and in placing office workers. There is frequently enough variation in the temperature of different parts of the room to accommodate a variety of tastes. It is safe to say that no person should be compelled to work or stay where he feels chilly, since such a body reaction seems to predispose to infection in the nose and throat.

Reasonably Humid Air

"As to the technic of securing comfortable indoor conditions, that is a matter for air-conditioning engineers. If the humidity be low, higher temperatures are required for comfort, the differences often being surprising. It is, therefore, found to be a matter of economy that the air be kept reasonably humid.

"We should really leave the question an open one until more well-controlled facts are available. Fresh air there must be, but without drafts, and if the cooling properties of the air are carefully controlled, we find that a smaller intake from the outside is needed.

Indoor air conditions should be adjusted to give comfort to each individual so far as possible, believes Dr. Mills, and people who differ in their heat needs and must live together, should study their individual situations well and take for themselves those parts of the house that best meet their needs.

Grandmother needs her warm corner in the living room, while the high school boy or girl should have a cool study or den for doing night work.

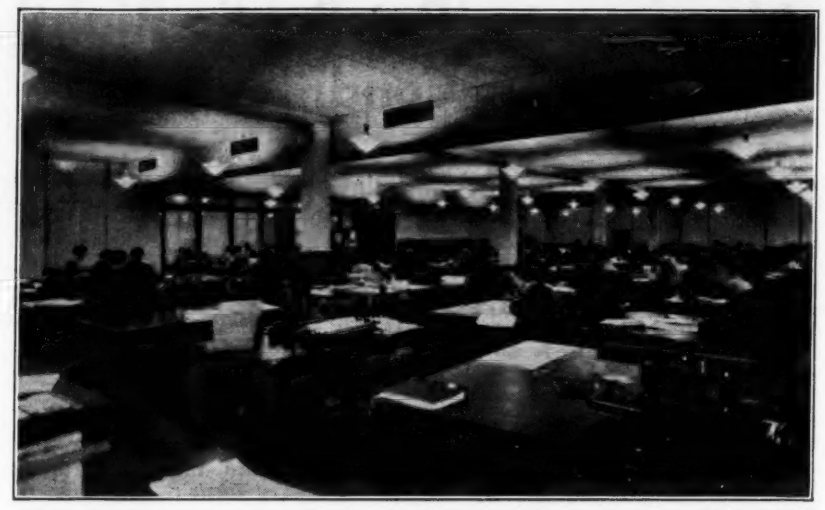
The nursery should be warm for infants, but for active children of two to five years less heat is needed.

One person should not chill just because another is too warm. Chilling at 75° F. is, for the person who chills at that temperature, just as harmful as is chilling at 60° F. for the more warm blooded individual, declares Dr. Mills.

It should always be kept in mind,

(*Concluded on Page 15, Column 1*)

Oil Firm Adopts Air Conditioning



General office of the new, completely air-conditioned home of the Lubrite division of Socony-Vacuum Oil Co. in St. Louis. The air inlets are in the center of the room, directed toward the outside walls and windows, and air sweeps the outside wall before drifting toward the return outlets.

Waiting room of the Lubrite service station adjoining the company's office building. The year-'round conditioning unit against the center wall operates independently of the main part of the building.

FOR AIR CONDITIONING too!

V-METH-L VIRGINIA SMELTING

(Virginia Methyl Chloride, made by the makers of ESOTOO)

A pure, efficient refrigerant ideally suited for use in the modern air-conditioning system—and for Ice Cream Cabinets, etc., as well.

Being refined and sold by the Virginia Smelting Company, makers of ESOTOO, its purity is assured; both moisture and acidity are reduced to the minimum.

Shipped in containers holding 1200, 90, 6 and 3½ lbs. Prompt deliveries from stock at 49 distributing points. For complete details, mail coupon.

VIRGINIA SMELTING CO.
WEST NORFOLK, VIRGINIA

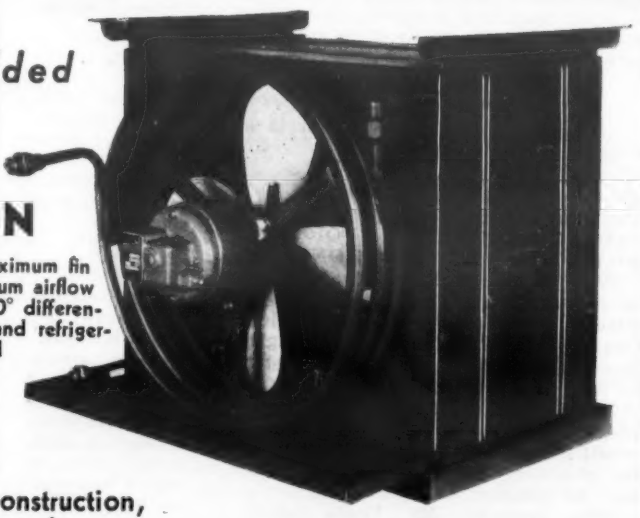
MAIL THIS COUPON Now

F. A. Eustis, Sec'y, Virginia Smelting Co., 131 State St., Boston, Mass.
Send me the literature I have checked. I am interested in receiving any additional literature on Electrical Refrigeration you may issue from time to time.
☐ Folder: Extra Dry ESOTOO (Liquid Sulphur Dioxide) ERN-4-24-35
☐ Folder: V-METH-L (Virginia Methyl Chloride)
☐ Folder: Transferring from large to small cylinders
☐ Circular: Physical properties of various refrigerants
Name .....
Street & No. .....
City & State .....

KRAMER UNIT COOLERS

Manifolded for FREON

Designed with maximum fin surface and minimum airflow for greater than 20° differential between air and refrigerant for process and commercial cooling applications.



All copper construction, brass shell, entirely non-corrosive, finished brown crackle.

Send for KRAMER Refrigeration Catalogs

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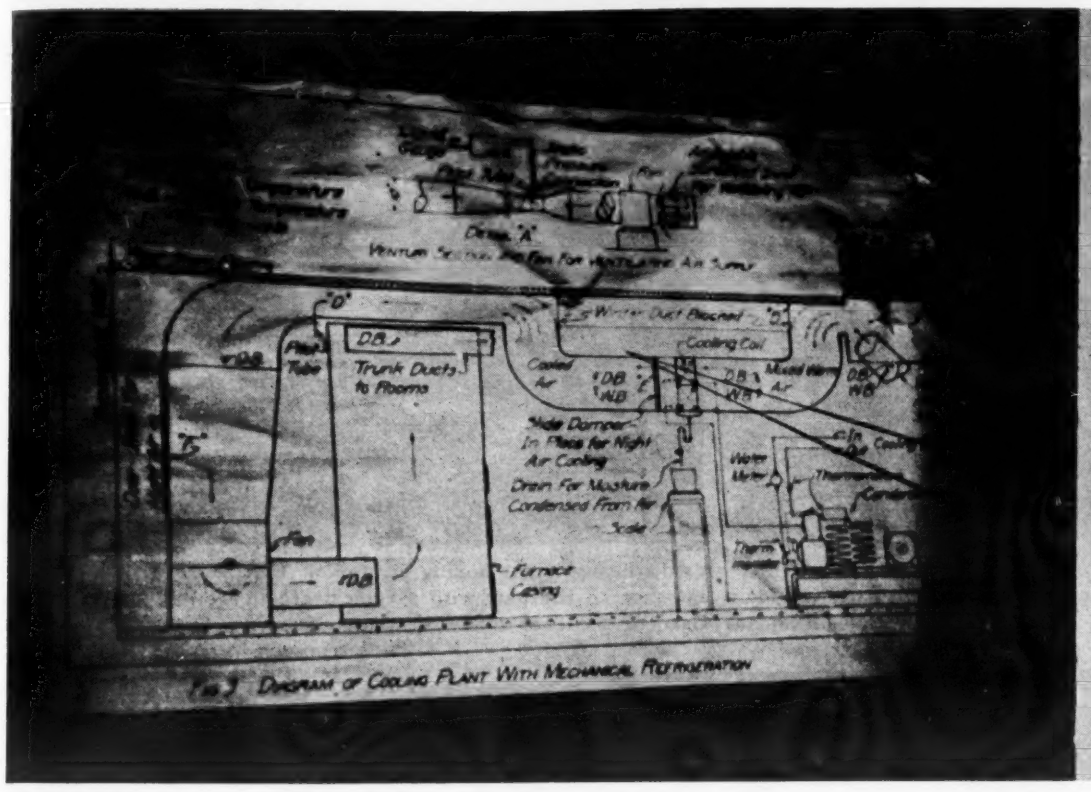
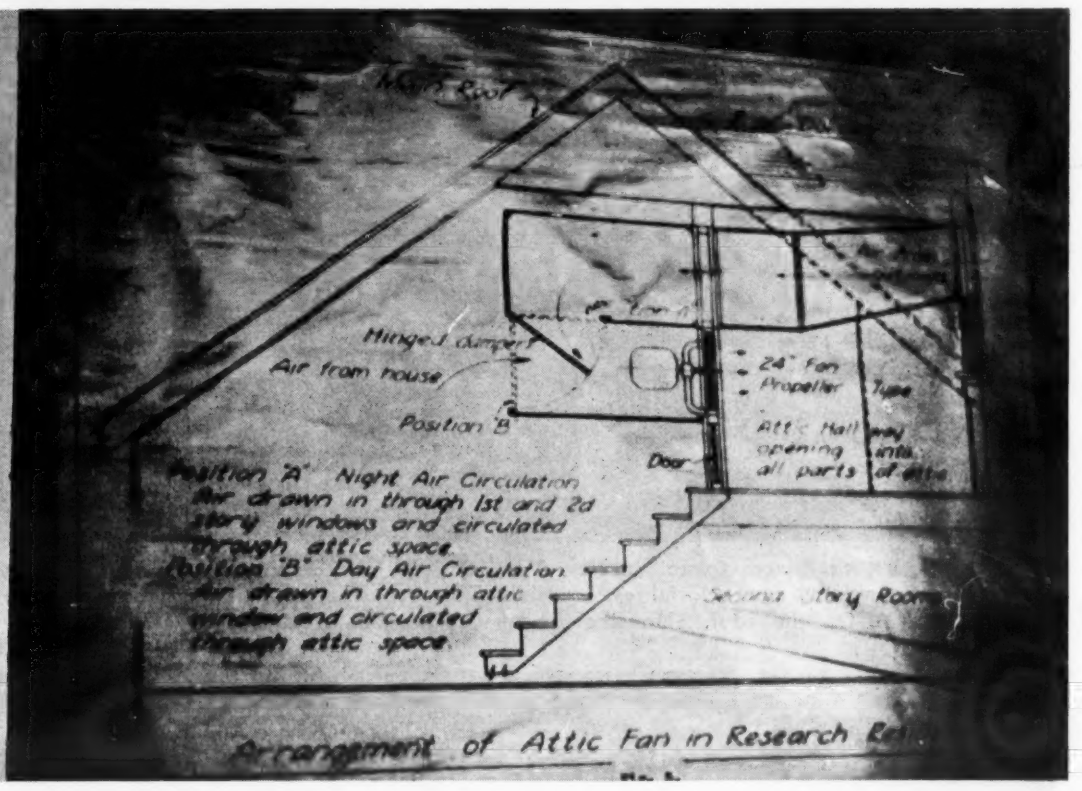
(Overnight express delivery to all points as far west as Chicago, Ill.)

TRENTON AUTO RADIATOR WORKS
Main Offices and Factory, TRENTON, NEW JERSEY
NEW YORK, 210-212 West 65th Street PITTSBURGH, 5114 Liberty Avenue

Prof. Kratz's Diagrams Show Cooling System in Famed U. of I. Research Residence


Trunk Ducts to Rooms
Cooling Coil
Side Damper In Place for Night Air Cooling
Drain For Moisture Condensed From Air
Furnace Casing
Fig. 1 Diagram of Cooling Plant With Mechanical Refrigeration


Hinged damper
Air from house
Position 'B'
Door
24" Fan Propeller Type
Position 'A' Night Air Circulation Air drawn in through 1st and 2d story windows and circulated through attic space.
Position 'B' Day Air Circulation Air drawn in through attic window and circulated through attic space.
Arrangement of Attic Fan in Research Re

Photographs of two of the lantern slides with which Prof. A. P. Kratz of the Engineering Experiment Station, University of Illinois, illustrated his talk on "Summer Cooling" at the combined April meeting of the Detroit sections of the A.S.H.V.E. and A.S.R.E. (1) Diagram of the cooling plant of the Illinois research residence, showing the installation of evaporator in central duct by-pass, and the placement of recording instruments. (2) Arrangement of attic fan, showing position of damper for day and night air circulation. These photographs of Prof. Kratz's lantern slides were taken by the editor from an audience seat during the lecture. The original photographs, from which these enlargements were made, were about the size of a postage stamp.

Dr. Mills Explains How Air Conditioning Will Improve Health & Economic Activity

(*Concluded from Page 14, Column 5*)

he avers, that inner fires burn most brightly in childhood and youth, and that we must not judge indoor comfort for children on adult standards. After 25 the fires burn with less brilliance and by 50 have become reduced to glowing embers. By 70 there is little warmth left within and outside temperatures must rise if comfort and health are to be maintained.

"Summer cooling is of major importance in the South, but could also be used to good advantage for the heat waves in the North when man's vitality goes into a sudden tail spin," states Dr. Mills. "Regions like parts of Japan and the Yangtze Valley of China would benefit tremendously from night-time cooling of sleeping quarters with the resulting rise in energy level.

"Everyone is aware of the rejuvenating effects of a comfortable night's rest during the severe heat waves of summer, and how the next day's heat seems less depressive. In summer, as at other times, the trials and tribulations of life seem less of a burden when one gets plenty of restful sleep.

Cooling Tropical Schools

"An experiment not yet tried but worthy of thorough consideration is the cooling of school buildings in tropical and sub-tropical lands and keeping the children in school through the summer heat. This would supply the youngsters with six hours of cooling daily, which on animals has been found to be very stimulating. Growth and development would be more rapid and general vitality higher with such summer cooling.

"Vacation time could well be placed in the ideal Spring and Fall weather. For countries like Japan, where there is a real desire for better childhood development, such an idea as this is well worth a thorough trial. Our school authorities of the Gulf states should likewise give it consideration."

Misfits Because of Weather

Dr. Mills says it is often unwise for some people to contend with the weather where they happen to reside, when their bodily and mental comfort under conditions of lesser stress would repay them for a lowered earning power.

Sample: "So long as considerations of wealth over-rule those of health we will see millions of people living on in regions where they are sad biologic misfits. *Future development of indoor air conditioning may help such misfits to comfort and health without migration.*

Control of Tuberculosis

"Tuberculosis may be well handled in any climate by proper indoor control, for by such means ideal climatic conditions for the diseases may be artificially produced. With asthma and hay fever, for instance, great relief is obtained in home and office by proper washing and conditioning of the air.

"Rooms in hotels or sanatoria could easily be prepared to mimic tropical heat for quieting the over-dynamic northern business man, rooms where he could go for two or three weeks rest without the expense of a long trip and interruption to control of his business.

"No doubt future years will see the development of artificial climates in each city where people unable to leave the city can still have the quieting benefits of southern moist air or the stimulation of a mountain resort."

For those who can afford it, provision for cooling sleeping quarters in hot weather is advisable, believes the Cincinnati professor of medicine. Quoting from his book:

"The heat of the day matters much less if good refreshing sleep is obtained at night. The air-conditioning industry is ready now with many devices for this purpose, and, with greater volume of sales, could bring indoor cooling down to a low expense level."

Hospitals Cooled During Heat Waves

Cooling during heat waves is more important in hospitals and sanatoria than in homes, says Dr. Mills, for patients' resistance to infections is markedly lowered by the heat. He thinks it imperative for hospitals working with acute appendicitis and other infectious conditions to provide adequate protection against the heat.

Sanatoria for tuberculosis likewise should be equipped for cooling, since ability to fight the disease is lessened by too high temperatures.

For the individual existence of the native in tropical regions the weather presents few problems, Dr. Mills points out. Nature seems to him rather beneficient, making food easily available and shelter need easily met.

"So long as such people are content with their low level of energy and complacent existence, little advice can be given," avers the author.

Night Cooling Needed

"If they should wish to step up to a higher plane of action and be able to compete on more even terms with northerners, then let them eliminate the depressive summer effects by night-time cooling of sleeping quarters.

"Such a step is coming for large areas of tropical heat just as surely as heating came to make enlightened living possible in the cooler areas of the earth. Think of the enormous fertile regions of Africa and South America that have scarcely been touched by man, just awaiting for their development, some means by which man may live there at a high energy level. *Such a means is now made available by newer methods of indoor cooling."*

Mass Test Proposed

It would be most interesting, said Dr. Mills, and, to industry, worth many times the cost, to try a mass experiment such as air-conditioning a leper colony somewhere in the tropics; not only to see what it would do to leprosy, but to see what changes it might produce in the human mechanism.

"Would people so stimulated respond as have experimental animals, with the development of greater energy, a higher metabolic level, and more vigorous existence in all ways?" he asks. Such a study in human adaptation has never been attempted, the author says, but studies on tropical and oriental persons coming to the storm belt of America indicate that the human response would be quite in line with that observed among animals.

G-E Air Conditioners Will Be Installed in Westchester Homes

NEW YORK CITY — Homestead Estates, Inc., developer of suburban New York real estate projects, has placed a large order for General Electric air-conditioning equipment and oil-burning furnaces, to be used in two Westchester county developments, Pine Hills at Purchase and Purchase Hill.

The order, placed with Schwerin Air Conditioning Corp. of New York, calls for 50 General Electric oil-burning furnaces and for G-E summer air-conditioning equipment to be used with 75 per cent of the installations. Radiator heating and winter air conditioning will be combined in 50 per cent of the installations, while 25 per cent will employ complete air conditioning without refrigeration.

The heating and conditioning systems will be used in new homes to be constructed at both developments, which occupy adjoining tracts of land at Purchase, N. Y., near White Plains. Pine Hills at Purchase comprise 200 plots of a minimum size of 100x100 ft., with complete house and lot costs ranging from $7,500 to $10,000. At Purchase Hill, which adjoins on a higher elevation, the range is from $13,500 to $35,000.

Houses of varying design will be built to order by the developers, with Lucius S. Beardsley retained as consulting architect.

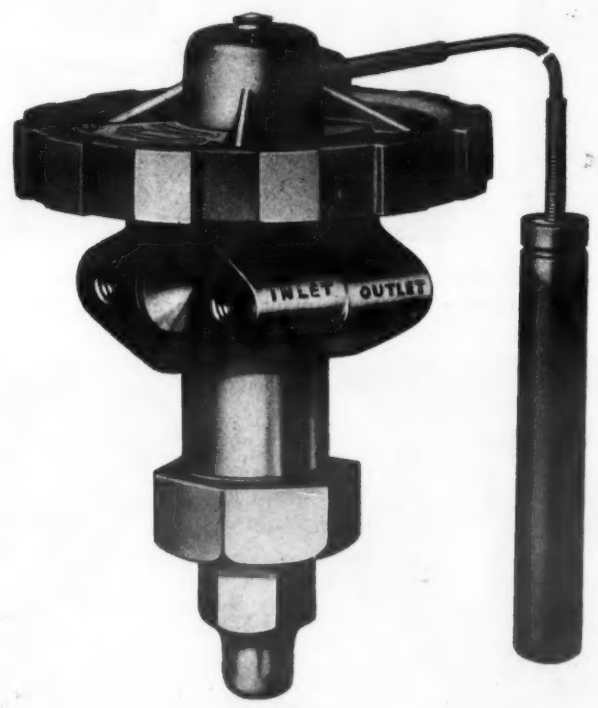
The Federal Housing Administration has approved both developments and recommended the company for loans on 20-year FHA financing plan.

S-N Booklet Deals with Calculation Methods In Air Conditioning

ST. LOUIS—Scott-Newcomb, Inc., manufacturer of air-conditioning and oil burner equipment, has just issued a book dealing with air-conditioning calculations and duct layouts.

The book gives detailed information on heat loss calculations, heat gain calculations for summer cooling, and layout of duct systems. A psychrometric chart, designed by Mr. Shepperd, research engineer for Scott-Newcomb, Inc., is included.

Also contained in the book are tables giving information such as a transmission coefficient of the more common wall, floor, ceiling, and roof constructions.



A New
Expansion Valve
FOR AIR CONDITIONING

The Model 220 thermostatic expansion valve has been in actual operation for the last two years and is now available in a number of different orifice sizes. The body parts are all brass forgings, operation is simple and frictionless, due to the small number of parts.

Here is an expansion valve which has built into it the same care, precision and sound design and construction of other A-P Controls.

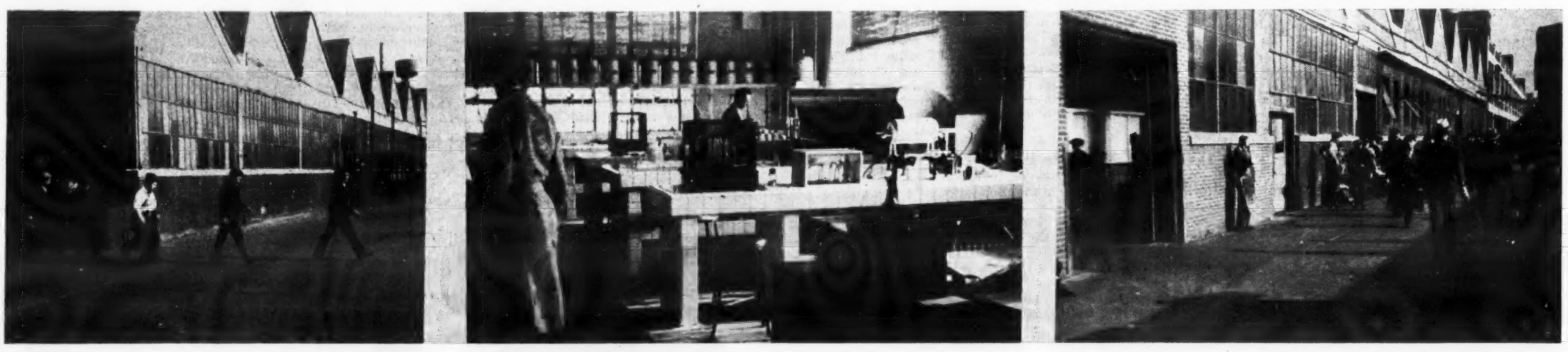
Write today for Bulletin 408 giving you details, prices, installation instructions and other surprising features of this new control.

AUTOMATIC PRODUCTS COMPANY
121 N. Broadway Milwaukee, Wis.

Air-Conditioning's Progress Seen Through Camera's Eye

High on the list of "places to go" in New York City is Jack Dempsey's, the new restaurant opened recently by the former world's heavyweight boxing champion. Celebrities of sport, stage, and screen, as well as smart socialites, are among the regular patrons of this completely air-conditioned cafe and bar. (1) Main entrance to the bar, with a typical crowd waiting to get inside. (2) On the roof. Housing for the restaurants ventilation equipment. (3) Just across the street—Madison Square Garden, scene of many a famous Dempsey battle.

(1) Patrons in the beerstube of the Dempsey restaurant. (2) This display of refrigerated meats is aimed at the eye of even the most casual visitor to Dempsey's. It takes up a large space in a corner of the main dining room. Ceiling-type unit cooler may be seen at the rear of the compartment. (3) The main dining room itself, walls lined with celebrities' autographed photos, and tables crowded with early-evening diners. Ordering from the waiter at the extreme right is Merlin Aylesworth, president of the National Broadcasting Co.



(1) Their day's work done, Chrysler workmen leave the plant for their homes. (2) Another scene in the engineering laboratory. (3) The Chrysler plant from another angle. These candid camera views of Chrysler's Detroit plant are rare shots, for photographers are seldom welcomed within the Chrysler gates.

When engineers get together to talk about summer cooling, they make a business of it—and eating is only incidental to finding out the "how" and "why" of things. Here are Detroit A.S.R.E. and A.S.H.V.E. men at their April meeting. (1) Prof. A. P. Kratz, speaker of the evening, explains that using outside air for night ventilation in Illinois' research house cut down costs considerably. (2) "We found the total heat absorbed during the season was equivalent to an ice meltage of 29 tons." (3) G. B. Helmrich (eating) of Detroit Edison Co. mentally compares Prof. Kratz's figures with those obtained in a similar project in Birmingham, Mich., which he explained to engineers present. (4) Rollin Hyde, with hand upraised, and D. P. Heath, both of McCord Radiator Co., believe the professor knows his stiff. (5) The delegation from Ford Motor Co. said little, but took plenty of mental notes.

A.S.H.V.E. members at the meeting listen and learn. (1) "Shutting off the third floor of the house at Urbana undoubtedly did a lot to reduce operating costs." (2) "1934 had an unusually severe summer—$40 to $50 doesn't seem excessive." (3) "A 2-ton machine is large enough to cool the average sized home." (4) "The dinner? Oh, yes—I'd almost forgotten."

AIR CONDITIONING

1,660 Air Conditioned Railroad Coaches Are Ordered Since Jan. 1

By A. J. Cutting

WILMINGTON, Del.—That air conditioning for human comfort is being viewed with increasing importance as a factor in stimulating railway travel is indicated by the fact that 1,660 air-conditioned passenger cars have been ordered by American railroads since the beginning of 1935.

As reported for April 1 of this year, 4,187 air-conditioned cars were in service or being built to fill orders. These figures are furnished by R. J. Thompson of Kinetic Chemicals, Inc. together with a detailed record of air-conditioned cars in use or ordered by various railroad lines in the country.

Travelers in present day railway trains are accustomed to comfortable living and transportation and desire clean, cool air of the correct relative humidity during the hot summer months.

The movement toward air conditioning of railway coaches, parlor cars, lounges, diners and Pulman cars has only developed during about the past three years, but this year's orders indicate that air conditioning has been proven successful and will be widely used in railway transportation in the future.

About one-half of the passenger cars which are being equipped this year are Pullman-owned while the balance are owned by individual railroads. Of the total air-conditioned cars in service or being built 1,406 are Pullman-owned.

The Pennsylvania Railroad will have 354 air-conditioned passenger cars in operation on its lines when the 78 new systems ordered since January 1 have been installed. Cars equipped with air-conditioning systems on the Santa Fe road will total 339 of which 280 are 1935 installations, while the New York Central will operate 319 including 235 newly ordered systems.

Other large users of air-conditioned cars in 1935 will be the Southern Pacific with 292, the Chicago & Northwestern which will have 211 cars equipped, the Baltimore & Ohio with 208, the Chicago, Milwaukee & St. Paul with 171, the Missouri Pacific with 127, and the Union Pacific with 101.

In mechanical refrigeration systems for railway car conditioning, Freon has been most widely used as the refrigerant, there being 1,234 Freon systems in operation up to the beginning of 1935. Approximately 735 of the systems being installed this year will also use Freon.

Ice has been used for cooling in 1,046 cars which were in service prior to 1935 and about 390 of the new systems will be ice-type. A decided gain in the number of steam systems was shown in the early months of this year with 451 new orders reported as against 238 steam equipped cars in service before 1935. The types of systems to be installed in the remaining 84 cars to be air conditioned is not known at this time.

The table below shows the total number of air-conditioned cars on various railway lines.

Waukesha Makes First Shipment of Train Air Conditioners

WAUKESHA, Wis.—First shipment of units on the largest single order for air-conditioning equipment thus far placed by the Chicago & Northwestern Railway was made by the Waukesha Motor Co. recently. The railroad has conducted tests for the past year on the Series 2000 Waukesha Melcher multiple unit air conditioners.

Tests have been made on other Waukesha Melcher series during the past four years. Records of operating costs during this period showed a cost of less than $2.60 per thousand car miles for year-'round service.

Interchangeable Units

The Waukesha Melcher air-conditioning system consists of a number of interchangeable self-contained units fastened to the under frame of the car, electric switch panels and thermostat control within the car, and grilled openings to cover the air duct outlets.

Each power unit is built in two sections. The upper one contains a "Sirocco" type blower which circulates the air through the ducts built in the pier panels of the car.

Two-Position Damper

A two-position damper in this section changes the direction of the air stream for summer or winter operation—in summer the air enters the car at the six-foot level from the upper grilles and leaves by the lower ones placed along the wall at the floor. In winter, the air enters at the floor and is warmed by the adjacent steam pipes along which it is distributed.

The air section also contains an air filter of the impingement type and a regulating damper to control the amount of fresh air which is added to the system constantly.

Refrigeration Section

Below the air section is the refrigeration section held to the form by four large pins with cotters to facilitate dismounting for inspection or replacement. This section is a self-contained refrigeration plant with no outside pipe or tubing connections—only the electric power lines, which have detachable connectors, are attached to the car.

The refrigeration plant consists of a structural steel base supported by two cast steel end frames with the entire assembly protected by sheet steel side panels with ventilation louvres to permit free circulation of air around the mechanism.

4-Cylinder Compressor

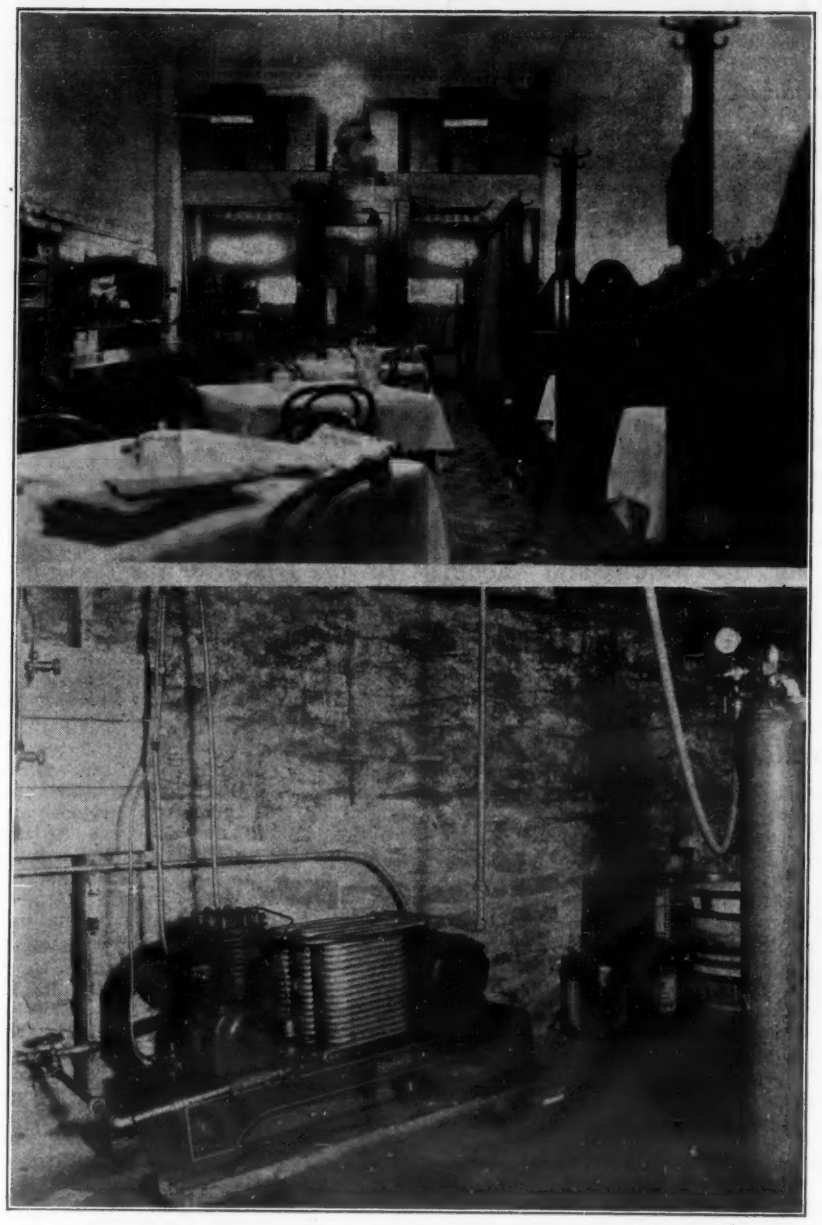
A 4-cylinder air-cooled compressor, driven by a 2-hp., 32-volt motor, is mounted on the base with the condenser and cooling fans for both the condenser and compressor. A multiple V-belt drive is used.

Projecting from the top of this section, and supported by the same frame, is the cooling evaporator which is inserted into the air duct of the upper section when the unit is assembled. All of the air entering the car passes through this cooling coil. Temperature is automatically controlled by the thermostat in the car.

Air Conditioned Passenger Cars

	Ordered Since Jan. 1, 1935	Jan. 1, 1935 Freon	Methyl Chloride	Ammonia	Ice	Steam	Water Evaporation	Total
Alton	31	24	0	0	0	0	0	55
Atlantic Coast Line	0	0	0	0	0	7	0	7
Santa Fe	280	0	0	1	0	58	0	339
Boston & Maine	0	0	0	0	11	0	0	11
Baltimore & Ohio	87	121	0	0	0	0	0	208
Chesapeake & Ohio	14	18	0	0	0	0	0	32
Chicago, Burlington & Quincy	2	8	0	0	17	0	0	27
Chicago & Eastern Illinois	30	0	0	0	4	2	0	36
Chicago, Milwaukee & St. Paul	149	0	0	0	0	22	0	171
Chicago & Northwestern	189	4	2	0	16	0	0	211
Chicago, Rock Island & Pacific	1	0	0	0	9	12	0	22
Dela., Lackawanna & Western	10	0	0	0	9	0	0	19
Denver & Rio Grande	4	0	0	0	12	0	0	16
Erie	0	0	0	0	0	20	0	20
Great Northern	43	0	0	0	13	0	0	56
Illinois Central	0	11	0	0	0	0	0	11
Lehigh Valley	0	2	0	0	0	0	0	2
Louisville & Nashville	30	0	0	0	0	8	0	38
Maine Central	0	0	0	0	7	0	0	7
Missouri, Kansas & Texas	3	3	0	3	0	6	0	15
Missouri Pacific	89	16	1	0	11	10	0	127
Nashville, Chatta. & St. Louis	0	0	0	0	0	5	0	5
New York Central	235	69	0	0	15	0	0	319
New York Central (B & A)	0	4	0	0	0	0	0	4
Nickel Plate	1	1	0	0	0	0	0	2
New Haven	0	42	0	0	25	0	0	67
Norfolk & Western	16	7	0	0	0	0	0	23
Northern Pacific	22	19	0	0	0	0	0	41
Pennsylvania	78	42	1	0	232	1	0	354
Pullman Co.	0	730	0	0	604	71	1	1,406
Reading	20	9	0	0	0	0	0	29
Richmond, Fredericksburg & Potomac	0	5	0	0	0	2	0	7
Seaboard Air Line	5	26	0	0	0	0	0	31
Frisco	2	0	0	0	29	0	0	31
Southern Pacific	260	19	0	0	13	0	0	292
Texas & Pacific	1	0	0	0	0	7	0	8
Union Pacific	45	53	0	0	0	3	0	101
Wabash	0	1	0	0	19	0	0	20
Western Pacific	0	0	0	0	0	4	0	4
Central of Georgia	2	0	0	0	0	0	0	2
Florida East Coast	11	0	0	0	0	0	0	11
Total	**1,660**	**1,234**	**4**	**4**	**1,046**	**238**	**1**	**4,187**

Cool Comfort for a Small Cafe



Hong Kong restaurant in Des Moines which has cool comfort furnished by a Brunner installation. The 3-hp. unit (shown below) supplies refrigeration through the McQuay overhead cooling units shown above. A 15° F. temperature differential is maintained.

Georgia Installations Show Great Increase During First 3 Months

ATLANTA—A total of 388.5 hp. in air-conditioning load was added to the lines of the Georgia Power Co. during the first quarter of 1935, making about three-fourths as much as the total of 553 hp. which was added during the entire year of 1934, report officials.

Included among recent air-conditioning installations are: S & S Coffee Shop, Augusta; New York Cafe, Macon; Modjeska Theater, Augusta; Imperial Theater, Augusta; Callaway Mills, LaGrange; Davison-Paxon's Tea Room, Ship Ahoy Restaurant, Harvey's Restaurant No. 1, Gordon Theater, RKO Building (film distribution firm), and the residence of P. Wiley Ballard, all of Atlanta.

New Filter Introduced By Owens-Illinois

TOLEDO—A new improved "Dustop" replacement type air filter for air conditioners has been introduced by the industrial materials division of the Owens-Illinois Glass Co. here.

The filter is fire-resistant and is made up of a series of coarse and fine mats of glass fibres, bonded together to form a semi-rigid mat. Fibres are laid down by machine, giving uniformity of filter pack density.

Dust and dirt-catching adhesive, manufactured by the company, has a dirt-holding capacity and surface tension four times that of engine oil, thus leaving no oil vapor in the air stream. Melting point of the adhesive is 540° F. and is effective to 23° F. below zero.

Penn Controls to Be Shown At Chicago Exhibit

CHICAGO—Penn Electric Switch Co. will display controls and switches in an exhibit at the air-conditioning show to be held here May 20 to 25 inclusively by the National Society of Air Conditioning Engineers, reports Nelson Delavan, sales manager.

P. L. Tolerton and E. B. Maire of the Chicago office of the Penn company will be in charge of the display.

YOU'LL KNOW WHY...

IF YOU TAKE ONE APART

● You'll know why every customer, to whom you sell a York machine, will be satisfied with its performance...why it will give him uninterrupted service year in and year out . . . why operating and maintenance costs will be low. Then, too, you'll know why one York machine always sells another . . . why every York job will help you build good will, sales and profits. And when you study York's complete line of Commercial Refrigerating and Air Conditioning units you'll also know why York distributors and dealers are always able to offer the correct system for each job . . . correct as to capacity . . . correct as to type. It will pay you to get the facts on York equipment . . . product of an organization that has been building commercial and industrial refrigeration for the past half century.

The coupon is attached for your convenience. Use it to secure more detailed information. There is still time to cash in on a York franchise this season.

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SERVICE

How to Make Air-Conditioning System Ready for Use after Winter Shutdown

By L. Gale Guggins, Commercial Engineer, Air Conditioning Dept.
Westinghouse Electric & Mfg. Co.

DESPITE the press of new spring business, dealers should take time to build the greatest asset to any business—"a satisfied customer"—by giving proper attention to spring servicing of the air-conditioning equipment installed in past seasons. The cooling and refrigerating part of many of these systems have been shut down during the winter and should be put in proper condition for the coming summer's work.

If the refrigerating equipment received proper service when it was shut down last fall, spring servicing will be simplified as the parts of the system not used for winter air conditioning were properly protected during the winter.

The following instructions for spring servicing of air-conditioning equipment cover equipment which was shut down and disconnected for the winter period and also for servicing of systems which were merely allowed to stand without attention after the cooling season was completed last fall. Therefore, all items will not apply to all jobs.

Air-Conditioning Unit

Before the equipment is started up, it should be carefully checked to make sure that it is in proper condition to start. The following operations should be performed on the air-conditioning units:

1. *Remove filters* and either replace with new filters or if they are the cleanable type, clean and recondition them.

2. *Clean heating and cooling coil surfaces* using water and either a stiff wire brush or a flexible metal bristle brush. Most of the dirt collected on the heat transfer surfaces will be found on the air inlet side of these coils.

3. *Clean and flush out the drip pan* and drain connection to the unit. Make certain that drain pipes are free of all obstructions and that any traps in the drain lines are clean.

4. *Clean and lubricate fan motors.* If motors are of the commutator type, clean the commutators and brushes. Replace brushes if necessary with parts obtained from the manufacturer.

5. *Check fan operation.* Make sure that the air delivery is approximately correct.

6. *Check noises.* Operate the fans and if there is any unusual noise, this should be eliminated. Also remove any rattles or mechanical noises which may show up.

7. *Check fresh air intake dampers,* ducts, and connections. Clean if necessary and make sure that dampers work properly.

8. *Set outlet grilles* properly for summer operation. The setting of outlet grilles or louvers often should be different for winter and summer to secure best results. This point should be rechecked after the system is running and supplying cool air.

Condensing Unit

After the above operations have been performed on the air-conditionings units, the condensing unit should be prepared for operation.

1. *Remove protective cover* of muslin or paper placed over the unit last fall. The unit should be cleaned by wiping it off with a rag moistened in gasoline or other solvent to remove the protective coating of oil applied to metal parts. The unit should then be wiped with a slightly oily rag so that some oil film is left on it.

2. *Clean the condenser* of air-cooled machines thoroughly, using a stiff brush or wire brush similar to that used for cleaning the evaporators. Make sure that any air ducts connected to this condenser are unobstructed.

Oil Motor Bearings

3. *Oil motor bearings* in accordance with the motor manufacturer's instructions. Any other points requiring lubrication, except the oil in the compressor crankcase, should also be cared for.

4. *Clean condenser water line strainer* and water regulating valve. If the valve seat in the water regulating valve looks worn, it should be replaced with a new seat obtained from the manufacturer of the valve. Do not use makeshift parts as they only encourage trouble for your customer and for yourself. Check the water regulating valve to make sure that the valve stem has not stuck in the packing. Repack this stem if necessary.

5. *Reconnect water inlet* and outlet piping to condenser if this was removed last fall. Open water shut-off valve and remove key or handle from valve to prevent water being accidentally shut off during the summer.

6. *Purge air and non-condensable vapors* from the condenser or liquid receiver. Follow detailed instructions in service manual for opening purge valve. Test purge valve cap with Halide torch after it is replaced.

7. *Check quantity of oil* in compressor crankcase. If the level appears low at this time, however, do not add oil as it may have been pumped into the condenser when unit was "pumped down" last fall.

Electrical Equipment

8. *Examine line starter* contacts and either clean up contacts with a file or if they are burned appreciably, install new contacts obtained from starter manufacturer.

9. *Replace fuses* in control circuit only and try control equipment. Make and break contact at the room thermostat and the hand control switch. Be sure the motor starter is operating in response to the various control devices.

10. *Replace power circuit fuses,* start condensing unit momentarily and check direction of rotation of compressor.

11. *Examine and clean refrigerant line strainer* on the condensing unit.

12. *Install pressure gauges* on the "high side" and "suction side" of the condensing unit.

Refrigerant Flow

13. *Check flow.* If the condensing unit is not provided with a permanent refrigerant sight flow indicator, install a service sight flow indicator for test purposes. In installing the sight flow gauge, be sure to purge air out of the piping with refrigerant while it is being installed.

14. *Open the liquid outlet valve* on the liquid receiver tank and allow sufficient Freon to escape into the piping of the system to provide approximately 25 lbs. pressure in the piping. Close this valve and carefully check all joints and connections on the condensing unit, on the refrigerant piping and on the air-conditioning units with a Halide test torch.

15. *If test indicates piping is tight* and free from leaks, open the liquid line valve completely allowing the refrigerant stored in the liquid receiver to escape into the system. Open the valve between the compressor and condenser and also the suction line valve. If pressure gauges are installed on gauge parts on these valves, be sure the gauge ports are not closed when the valves are opened.

Stabilized Operation

16. *All gauges should now read the equalized pressure* of the system, from 60 to 80 lbs., depending upon the room temperature. Start the air-conditioning unit and the condensing unit and allow them to operate in a normal manner from 10 to 15 minutes or until the system becomes stabilized in operation.

17. *During this initial running period,* watch the compressor oil level carefully. If this level does not return to normal after a few minutes, investigate and add oil recommended by the manufacturer if required.

18. *Observe liquid flow indicator.* If a solid stream of refrigerant is not secured, investigate and add Freon by the method recommended by the manufacturer of the condensing unit until a solid stream of refrigerant is secured. Then add the recommended surplus amount of Freon. Weigh and record the amount of Freon added at each operation.

Test Valves and Strainers

19. *With system in operation,* examine all valves and strainers in the liquid line. If these are restricted, there will be a temperature change at the valve which can be readily detected by an experienced service man. If such restrictions are found, clean the questionable strainer or make sure that the valve is open to give unrestricted flow of refrigerant.

20. *Put a thermometer on the evaporator* outlet at the point where the expansion valve bulb is attached to the suction line. Measure the temperature at this point and compare this with the temperature corresponding to the suction pressure. This should indicate approximately 10° F. superheat. If not, carefully adjust the expansion valve ⅛ of a turn at a time until the proper reading is obtained.

Check Water Valve

21. *Check operation and setting of water valve.* If the head pressure is not that desired, adjust the water regulating valve until the proper head pressure is obtained. After this adjustment is made, stop the condensing unit and make sure that the water regulating valve will shut tightly, completely stopping the flow of water. This will probably take from ½ minute to 2 minutes after the condensing unit is shut down before the water is turned off entirely.

22. *Check operation of the high pressure cut-out* by cutting off the water to the unit and recording the head pressure at which the cut-out stops the machine. If the machine is not stopped at the recommended head pressure (approximately 200 lbs. per sq. in. for Freon machines) the high pressure cut-out should be properly adjusted to stop the machine at this point. This high pressure cut-out is a safety device and its setting is important.

23. *With the system operating normally,* cooling properly, and a solid stream of Freon being obtained, the sight flow indicator should be removed, if one was installed specially for the test. In putting back the regular piping, the same precautions regarding purging air out of the pipes should be followed as outlined under paragraph 13.

24. *After removing sight gauge,* restart the condensing unit and with the system running normally, again check all connections and joints with a Halide torch.

25. *Remove all caution tags* put on the machine for winter use. Put a tag on the electric controller giving the dealer's telephone number for day and night service calls. This tag should also caution the owner not to try to make adjustments on the machines. If the apparatus was built by a reliable manufacturer and you have done your service work carefully and thoroughly, there should be little occasion for the customer to use this emergency telephone number.

Should Visit Customers

In performing this service work, the service man should continually keep in mind that he should do his work in such a manner that there will be no further occasion for a service call on this equipment until the owner is ready to shut down the cooling equipment next fall and prepare it for winter storage.

Air-conditioning dealers should solicit owners of equipment they have installed in past years for an order to check over their cooling equipment and put it in good operating condition. If this procedure is followed before hot weather actually starts, it will eliminate emergency calls from perspiring customers on the first hot day of the season informing you that they have tried to start their cooling systems and they will not operate properly.

By getting the apparatus properly adjusted for summer operation before it is actually needed, you render a real service to your customer. This service will be appreciated and may help close some of your present important negotiations.

S-N Introduces '35 'Junior' Model

ST. LOUIS—Scott-Newcomb, Inc., has perfected its S-N Junior burner for 1935 to include a number of additional features, and has modified its appearance so that it resembles in general outline the S-N model CJ pressure atomizing type burner. The unit, however, still retains the large orifice nozzle and the ability to burn the low grade oils.

The S-N Junior is arranged to fire into the ashdoor of the furnace, and uses a curved air chamber, similar to what is used on the Scott-Newcomb pressure burners. The 1934 model had its firing head located in the firedoor of the furnace, and the motor-compressor unit was on an upright stand at the side.

Air from the air blower is directed through the curved air chamber and is given a violent whirling motion at the point where it mixes with the atomized oil, which oil spray is electrically ignited. An electric magnet valve filter is used as an additional safeguard to shut off the oil from the burner when not in use, although the oil pump unit has its own shut-off valve.

The motor operates the compressor and pumping unit direct, and compressed air is delivered through a pipe located around the fuel pipe. This air mixes with the fuel oil at about 1½ lbs. pressure and causes very fine atomization, which permits the burning of much heavier grades of oil than can be used in a pressure atomizing burner.

Intake air runs through a muffler before going to the compressor, to reduce noise. Secondary air is adjusted by an adjustable band around the air intake of the blower.

Oil is pumped to the nozzle through a separate tube, and does not mix with the compressor air until it reaches the interior chamber of the nozzle tip. The pump measures the quantity of oil to be used, and can be adjusted for from ½ to 3 gal. per hour. It also lifts the oil from an underground tank when delivering oil at the nozzle in quantities from ½ to 1 gal. per hour, a feature accomplished here for the first time, S-N engineers claim.

H-B Develops Line Of Indicators

PHILADELPHIA—H-B Instrument Co., Inc., is introducing a new line of industrial indicating thermometers for equipment requiring temperature indication within the range of 0 to 350° F., as well as a line of recording thermometers and humidity indicating instruments.

The general purpose indicating thermometers are available in either the rigid stem or flexible capillary types. Rigid stem types have dial sizes of 2½ in. and in standard models, temperature ranges of 20° to 220° F., in 2° divisions, and from 150-350° F. in 5° divisions.

Flexible capillary types may be had in three models, with dial sizes of 2½ or 4½ in., and temperature ranges of 20-220° F., with 10 ft. tube, 20-220° F., with 12 ft. tube, and 150-350° F., with 12 ft. tube. Temperature divisions are marked by 2° on the first two models, and by 5° on the third.

Additional dial ranges for both rigid and capillary types are also available in 2½ and 4½ in. dial, but are made on special order only. Temperature ranges available on special order are: 0-100° F., in 5° divisions; 30-300° F., in 5° divisions; and 100-200° F., in 5° divisions.

Movement on all types is of the Bourdon tube vapor tension type, with rack and pinion of hard brass. The concentric dial is finished in satin silver, with black figures and divisions, and the case is of brass, with polished chromium finish, and is dust proof. Front of the case is covered by a heavy beveled glass, with knurled screw retaining ring.

Standard bulbs for all models are brass, nickel plated, but tinned and monel bulbs may be had at additional cost. Extension neck bushing for separable sockets are also available in 3-in lengths, as well as separable sockets in 3½, 6, 8, and 10 in. lengths, finished in either bronze, steel, or monel.

Temperature recorders for air conditioners, refrigerated transportation, cold storage rooms, dairies, laundry equipment, and the like, are available in either portable or distant reading models. The chart is of full 6 in. diameter, evenly calibrated, for easier reading. Element is the helical Bourdon tube, filled with a special liquid to assure sensitivity, steadiness, and accuracy of pen arm, and its design permits the bulb to be placed in any relative position from the instrument.

The clock is available for 24-hour or seven-day setting, and a wide range of recording charts is offered.

The portable temperature and humidity recorder has especially sensitive elements, the humidity element being special multiple human hair, and the temperature element spiral special bimetal. Charts are standard index cards, 3x5 in., with reverse sides ready to fill in date and record. The case is of die cast aluminum, satin silver finish, with square grid back for exposing the elements to the temperature and humidity to be recorded. Charts, in wide variety of ranges, are available for either 10 or 30 hour records.

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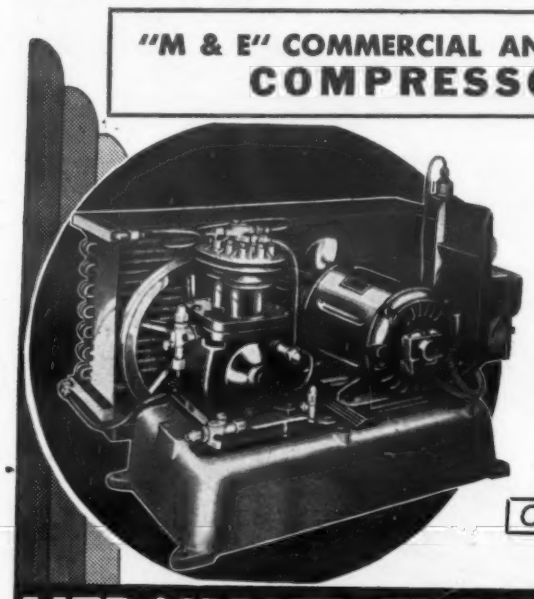

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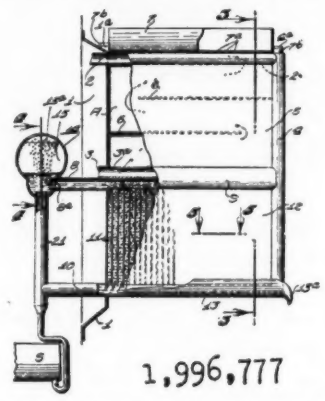
McCORD RADIATOR & MFG. CO., DETROIT

PATENTS

Issued April 9, 1935

1,996,777. CHILLING DEVICE. Henry E. von Seggern and Ernest A von Seggern, Escondido, Calif. Application June 29, 1932. Serial No. 619,896. 18 Claims. (Cl 62—126.)

14. In a chilling device, an evaporator means in communication with a source of liquid refrigerant, said evaporator means



1,996,777

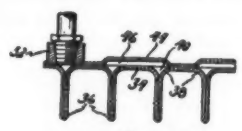
having a gaseous refrigerant receiving chamber at its upper side, and a gaseous refrigerant outlet therefor below said upper side, a receptacle communicating with said outlet to receive gaseous refrigerant therefrom, and means for maintaining a liquid refrigerant in said receptacle at a level above said outlet whereby the gaseous refrigerant from the evaporator means is caused to pass through additional refrigerant.

1,996,803. REFRIGERATION APPARATUS. Le Roy F. Goines, Gastonia, N. C. Application June 8, 1934. Serial No. 729,679. 6 Claims. (Cl. 62—159.)

1. Means for securing ice cans in brine tanks and supplying compressed air thereto comprising a flexible strip of wood having toothed members on its ends for engaging the sidewalls of the tank when the central portion is pressed downwardly to force the can downwardly and after the pressure has been relieved, an air supply pipe mounted in said strip for free swinging movement, a compressed air supply pipe and a flexible hose having one end connected to the compressed air supply pipe and having its other end detachably secured to the upper end of the air supply pipe.

1,996,808. REFRIGERATING APPARATUS. Edward Heitman, Detroit, Mich., assignor to Kelvinator Corp., Detroit, Mich., a corporation of Michigan. Application Oct. 19, 1932. Serial No. 638,495. 2 Claims. (Cl. 62—95.)

2. A sheet metal evaporator for refrigerating apparatus adapted to be arranged horizontally within a compartment to be

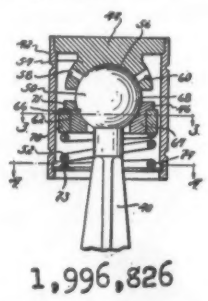


1,996,808

cooled comprising an upper substantially flat single piece sheet metal member, and a lower single piece sheet metal member having downwardly bent portions to provide heat absorbing fins and spaces between said members for conducting refrigerant therebetween and said upper sheet metal piece being provided with transverse portions to provide spaces for refrigerant interconnecting said other spaces.

1,996,826. REFRIGERATING APPARATUS. Grayson R. Ohmart, Detroit, Mich., assignor to Kelvinator Corp., Detroit, Mich, a corporation of Michigan. Application May 17, 1932. Serial No. 611,857. 4 Claims. (Cl. 309—20.)

1. In a compressor, the combination of a piston having a skirt, a sectional bearing within said skirt, a connecting rod

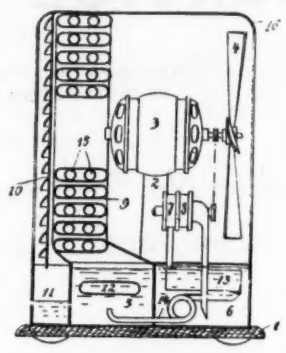


1,996,826

extending into said skirt in engagement with said sectional bearing, retaining means associated with said sectional bearing to maintain operating engagement between the sectional bearing and said connecting rod, said retaining means being movable relative to said piston to compensate for wear between said connecting rod and said sectional bearing, and a coiled spring arranged so that it continuously tends to move said retaining means.

1,996,870. APPARATUS FOR COOLING AND PROPELLING AIR. Friederich Kratky and Friederich Alfred Grohmann, Vienna, Austria. Application April 20, 1933. Serial No. 667,126. In Austria April 21, 1932. 1 Claim. (Cl. 62—129.)

An apparatus for generating a current of cold air with moisture content reduced to a regulable extent comprising a fan, a simultaneously operated refrigerating machine over the vaporizer of which an air current is drawn by said fan, an apertured screen in front of said vaporizer in the direction of motion of the air, said screen being adjustable with respect to said vaporizer to enable a portion of the moisture of the air which can be varied by moving the screen towards or away from the vaporizer to be precipitated, whereby on the one hand the

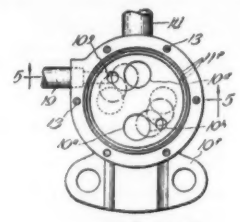


1,996,870

moisture content of the moving air can be regulated and on the other hand the formation of hoar-frost on the vaporizer which reduces the effect thereof can be prevented at least in part.

1,996,892. REFRIGERANT VALVE. Willard T. Weaver, Chicago, Ill. Application Nov. 4, 1932. Serial No. 641,131. 2 Claims. (Cl. 251—87.)

1. A refrigerant valve comprising a base, a head grouped in flatly-ground relation to one end of the base, the latter having



1,996,892

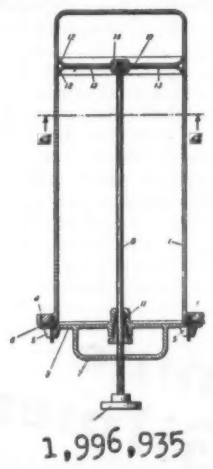
inlet and outlet passages opening on the head, the head having an internal passage adapted to communicate with said passages and being rotatable to remove its internal passage from communication with the passages in the base, the latter having a by-pass duct from the inlet passage and opening on the ground surface at one side of the center of rotation of the head, the base also being bored from one side with a duct whose outer end is adapted to receive a gauge pipe and whose inner end opens on the ground surface at a point opposite the opening of the by-pass duct, the ends of the internal opening in the head being of such size as to bridge both the passages in the base and the openings of the ducts at the ground surface when the head is given a relatively short partial turn.

1,996,907. THERMOSTAT. George Forrest Drake, Rockford, Ill., assignor to Howard D. Colman, Rockford, Ill. Application March 19, 1932. Serial No. 599,971. 20 Claims. (Cl. 200—138.)

1. A surface thermostat comprising, in combination, a rigid plate of non-metallic insulating material, a metal sheet mounted on one side of said plate and adapted to lie in contact with a control surface when the plate is mounted on such surface, a disk of bimetallic material lying adjacent said pate on the side opposite said sheet, a stud extending snugly through said plate and having its opposite ends rigid with said sheet and the central portion of said disk and control means responsive to relative axial movement between the central and outer peripheral portions of said disk.

1,996,935 ICE CREAM TRAY. Edward J. Silveira, Walnut Creek, Calif., assignor of one-half to Donald K. Lippincott, Larkspur, Calif. Application Sept. 12, 1932. Serial No. 632,654. 3 Claims. (Cl. 259—113.)

1. Means for making ice cream in the expansion chamber of a household refrigerator comprising the combination of a tray adapted to contain a material to be



1,996,935

frozen and fitting into said expansion chamber, a cover for said tray, a dasher assembly comprising a pair of plates of like shape placed back-to-back, each plate having a pair of large apertures, said apertures having an area sufficiently less than the cross sectional area of said dasher so that the velocity of the material passing therethrough is materially greater than the velocity of said dasher when moved therein and a peripheral outturned lip contacting the walls of said tray, and an operating rod separably connected to each of said plates and holding them together, said rod being operable through said cover for moving said dasher back and forth within said tray.

1,996,952. DEVICE FOR FEEDING HEATED ROOMS WITH WATER VAPOR. Michel Cohendy, Paris, France. Application Oct. 1, 1932. Serial No. 635,836. In France Oct. 31, 1931. 1 Claim. (Cl. 299—20.)

A device for humidifying the atmosphere of a room heated by means of a radiator, which comprises in combination, a reservoir adapted to contain a liquid to be evaporated for humidifying the atmosphere, said reservoir consisting of a box of very flat shape, one of the large faces of said box being prolonged upwardly so as to form a substantially plane support, the vertical edges of which are bent so as to form grooves, a panel of asbestos engaged in said grooves so as to be firmly applied against the inner side of said support, said panel extending downwardly to a certain distance into said box so as to dip in the liquid therein, and means for supporting the device in a vertical position.

1,997,058. FIN RADIATOR. Austin H. Hart, Long Branch, N. J., assignor, by mesne assignments, to Heating Appliances and Equipment Co., Inc., a corporation of Delaware. Application Sept. 8, 1931. Serial No. 561,528. 10 Claims. (Cl. 257—124.)

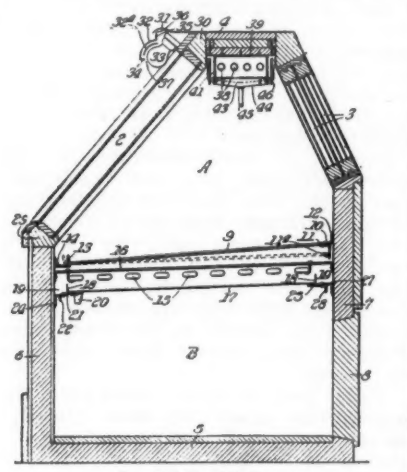
7. In a fin radiator the combination of a one piece cast hollow body member, having bosses cast at the lower ends thereof for inlet and outlet connections, and a raised abutment at each end of said core, with a fin member comprising a continuously folded metallic sheet providing a multiplicity of spaced fins, a slotted opening in each fin from the lower end thereof, having a flange at each side of said slot, said fin member being adapted to be mounted on the core so that the flanges fit against the sides of the core in gripping engagement therewith, and the end fin members abut against the raised abutments.

1,997,190. CONTROL SWITCH. Malcolm E. Henning, Des Moines, Iowa, assignor to Penn Electric Switch Co., Des Moines, Iowa, a corporation of Iowa. Application July 3, 1930. Serial No. 465,595. 1 Claim. (Cl. 200—88.)

In a control switch, a pivoted switch lever, electro responsive means for moving the same, a leaf spring element carried by and secured to said switch lever, said electro responsive means being engageable therewith when energized, whereby said lever is moved by tension of said leaf spring, a movable contact carried by said switch lever, a stationary contact for coaction therewith, one of said contacts being movable under tension with respect to its means of support, and a thermal latch for said switch lever in the position it assumes when said electro responsive means is enegized.

1,997,212. REFRIGERATING CABINET. Karl J. Gloekler, Pittsburgh Pa., assignor to Bernard Gloekler Co., Pittsburgh, Pa., a corporation of Pennsylvania. Application Nov. 24, 1933. Serial No. 699,545. 1 Claim. (Cl. 62—89.6.)

In a refrigerating cabinet, a casing having a base, a vertical front wall, a top, a sloping front window between the

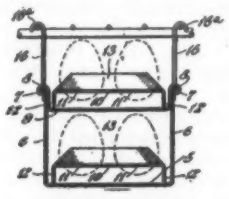


1,997,212

front wall and top, a rear wall extending between the base and top and having a lower and an upper opening and closures therefor, a transverse vertically and laterally adjustable and bodily removable rack, a collecting pan below the rack, terminating inwardly beyond the front and rear wall providing opposite circulation spaces, means on the rear wall adjustably supporting one edge of the pan, and a removable hook on the opposite edge of the pan engaging a slotted bracket on the front wall pivotally supporting its opposite edge for lowering or bodily removal.

1,997,220. REFRIGERATOR TRAY. John P. Kilgore, Fort Collins, Colo. Application Dec. 29, 1932. Serial No. 649,418. 2 Claims. (Cl. 211—114.)

1. A tray comprising, in combination, a body having a bottom and side walls but open at both ends; an egg carrier

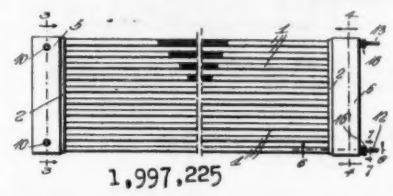


1,997,220

slidably supported on and with egg-carrying means space above said bottom and removable from either end; said egg-carrier being constructed and arranged for holding eggs spaced from each other and from the bottom; and a slidable cover shaped like a tray with raised longitudinal edges and closing the top of the tray body, said cover being so shaped and of such dimensions that it will support a second egg carrier exactly like the carrier on the tray bottom, so that two egg carriers may be carried by the tray or a single egg carrier may be supported either on top or on the bottom of the tray; any such egg carrier being confined against lateral movement by the sides of the tray or the raised edges of the cover.

1,997,225. REFRIGERATOR STRUCTURE. Tracy D. Montee, Rizal Province, Philippine Islands. Application March 9, 1934. Serial No. 714,871. 6 Claims. (Cl. 62—95.)

2. In a refrigerator structure, a plurality of brine tubes, heads extending transversely of said tubes and connected with ends of the tubes, and a coil for circulating heat absorbing fluid through the tubes and heads having its convolutions

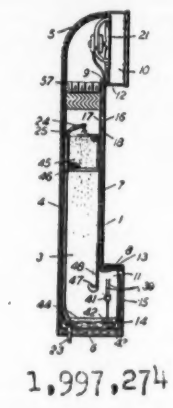


1,997,225

arranged in spiral formation and in stepped relation transversely of each other.

1,997,274. UNIT AIR CONDITIONER. Harry D. Betz, Kansas City, Kans. Application March 24, 1930. Serial No. 438,435. 16 Claims. (Cl. 261—117.)

1. In an air cooling unit adapted for use in connection with a source of refrigerated water supply, a housing com-

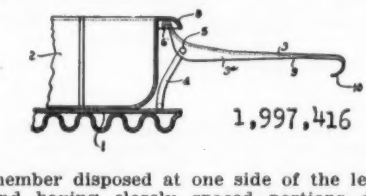


1,997,274

prising inner and outer shells and insulation between the shells and having laterally directed air inlet and air outlet openings at the bottom and top of said housing respectively, downwardly facing nozzles within the housing laterally directed air inlet and air outlet opening, a screen covering said accumulator, a water outlet pipe communicating with the accumulator, a direct motor driven propellor type fan arranged for creating an upwardly moving current of air through the housing and means for preventing flow of water from the housing except by means of the water outlet pipe.

1,997,416. LIFTING DEVICE FOR ICE TRAYS. Elliott E. Grover, Springfield, Mass., assignor to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., a corporation of Pennsylvania. Application March 1, 1934. Serial No. 713,444. 3 Claims. (Cl. 254—131.)

3. In apparatus of the character and for the purposes described, a lever having spaced ears at one side thereof, a loop



1,997,416

member disposed at one side of the lever and having closely spaced portions disposed between the ears, and means providing pivotal connection between said ears and said closely spaced portions, said loop member including a straight portion arranged parallel to the pivot axis and connected by side portions to said closely spaced portions, said side portions curving outwardly from the ends of the straight portion and inwardly toward the closely spaced portions, said lever having an engaging portion at one side of the pivotal connection and a handle portion at the other side, said engaging portion being wider than the overall width of the loop in the direction away from the pivot axis so as to engage the loop in one position thereof.

1,997,468. HUMIDITY RESPONSIVE DEVICE. Frederick S. Marcellus, Scotia, N. Y., assignor to General Electric Co., a corporation of New York. Application March 31, 1932. Serial No. 602,183. 3 Claims. (Cl. 297—1.)

1. A humidity responsive device comprising a tube, an elongated sack attached to one end of said tube, closing the opening therein and composed of a flexible material relatively unaffected by variations in humidity, a liquid filling said sack and partially filling said tube, a body surrounding said sack and composed of a material which expands and contracts with variations in moisture content thereby variably compressing said sack and causing the amount of liquid contained in said tube to vary with variations in humidity.

1,997,476. COMPRESSOR CONTROL SYSTEM. Frank O. Wallene, Lakewood, Ohio. Application March 26, 1932. Serial No. 601,393. 4 Claims. (Cl. 230—21.)

1. In combination, a compressor, a power operated driver therefor, said compressor having an adjustable clearance pocket, and means sensitive to variations in the intake pressure at the compressor and to variations in the power input to the driver for gradually adjusting the clearance pocket.

1,997,559. AUTOMATIC CONTROL SYSTEM. William J. Hajek, Brookline, Mass., assignor to Minneapolis-Honeywell Regulator Co., Minneapolis, Minn., a corporation of Delaware. Application July 7, 1934. Serial No. 734,113. 20 Claims. (Cl. 236—91.)

1. A system of the class described, comprising, in combination, a heater for heating a space, a space temperature responsive thermostat, an auxiliary heating means for locally heating said thermostat, connections between said thermostat, heater and auxiliary heating means by which said thermostat operates said heater to supply more heat and operates said auxiliary heater to heat the thermostat locally upon a call for heat, and an outdoor temperature responsive thermostat for varying the effect of said auxiliary heating means upon said space temperature responsive thermostat.

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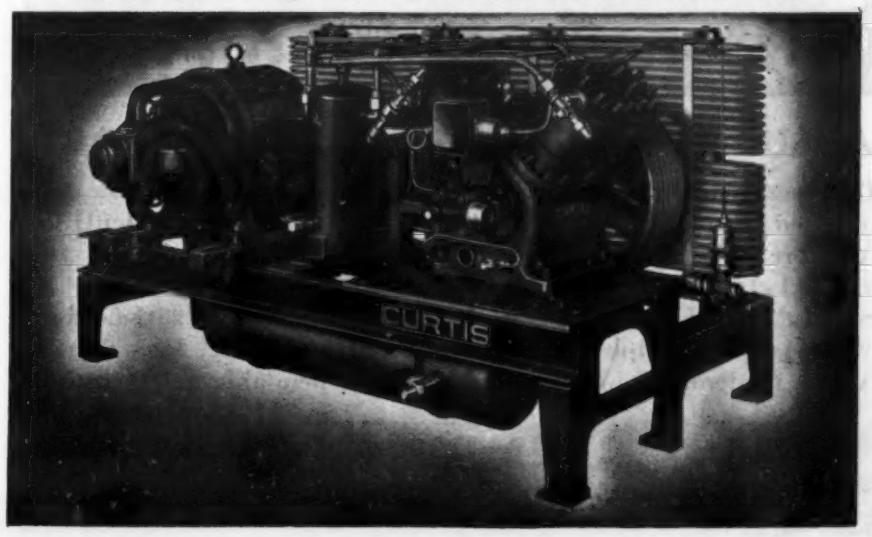

SERVICE

Properties & Characteristics of Common Refrigerants

By K. M. Newcum

Editor's Note: The third of a series of articles written by K. M. Newcum for the benefit of refrigeration and air-conditioning service and installation men appears below.

This article deals with refrigerants, telling the physical properties necessary for a good refrigerant and then describes in detail the properties and characteristics of the common refrigerants used in refrigerating systems.

The first article, which was published in the April 10 issue of ELECTRIC REFRIGERATION NEWS, dealt with the fundamentals of refrigeration while the second one, appearing in the April 17 issue, explained the operation of the principal parts of a mechanical refrigeration system.

Articles, which will appear in coming issues of the NEWS, will go into the subject of installation and servicing of refrigerating machines and will explain how the service man should proceed in handling the problems which he will meet most frequently.

So important are the functions of the refrigerant in the process of refrigeration that this chapter will be given to further their study.

The physical properties of the several refrigerants are such that they differ in their boiling points, their pressures at given temperatures, their odor, their refrigerating effect, and in many other ways.

A complete description of each refrigerant is given so that the service man may have the necessary knowledge of each to properly diagnose any irregularities existing in the system due to the refrigerant, and the mechanical apparatus controlling it's function.

Many liquids have some of the qualities necessary to produce refrigeration. However, to be commercially satisfactory, that is, to produce refrigeration economically over a long period of time with the least amount of attention and with the highest degree of safety, the refrigerant should have as many of the following properties as possible.

1. High latent heat of evaporation.
2. Low boiling point at atmospheric pressure.
3. Low condensing temperatures and pressures.
4. Low specific volume of vapor.
5. High critical temperature.
6. Low ratio of compression.
7. Non-corrosive action on metals.
8. Stable in its chemical composition.
9. Non-injurious to lubricating oils.
10. Non-flammable and non-explosive.
11. Non-injurious to health, lungs, and eyes.
12. Easy to test for leaks.
13. Low in cost.
14. Easy to handle as a liquid.
15. Convenient source of supply.

The refrigerants that have proved satisfactory through several years of actual use in the field are now labled "common refrigerants."

Sulphur dioxide is probably the most widely used of the common refrigerants in the domestic field.

Methyl chloride is used in many domestic and small commercial systems.

Ethyl chloride, though used in several of the earlier machines, has given way to some of the more popular refrigerants.

Ammonia has predominated the large commercial field, such as cold storage rooms, ice making plants, etc. It is also used as the refrigerant in the leading gas refrigerator.

Isobutane was exclusively used by one of the manufacturers in their domestic line under the trade name of Freezol for several years, later to be replaced by methyl chloride. Another manufacturer has since found isobutane to be very satisfactory in domestic refrigerators.

Freon (F-12), one of the more recently developed refrigerants, has found a very definite place in the commercial and air-conditioning field. It has also made its debut into the domestic field.

A list is given below showing many of the makes of refrigerators and the refrigerant employed. Exceptions are taken in some of the cases, where recent developments and policy changes have resulted in the use of a different refrigerant and in some cases the use of two or more different refrigerants in the different models. Some of the manufacturers listed are out of business, but there are many of the machines still in service.

Trade Name	*Refrigerant Used*
American Snowbird	Sulphur dioxide
Absopure	Methyl chloride
Apex	Sulphur dioxide
Buckeye	Sulphur dioxide
Bryant	Sulphur dioxide
Bohn	Sulphur dioxide
Coldspot	Sulphur dioxide
Crosley	Sulphur dioxide
Copeland (early models)	Freezol (Isobutane)
Copeland (later models)	Methyl chloride
Cavalier	Sulphur dioxide
Electrokold	Sulphur dioxide
Eskimo	Methyl chloride
Electro Icer	Sulphur dioxide
Electrolux (gas)	Ammonia
Frigidaire	Sulphur dioxide
Faraday (gas)	Ammonia
Gibson	Sulphur dioxide
Grunow	Carrene
General Electric	Sulphur dioxide
Gilfillan	Sulphur dioxide
Grinnell	Sulphur dioxide
Haven	Methyl chloride
Holmes	Ethyl chloride
Iroquois	Ethyl chloride
Ice-O-Matic	Methyl chloride
Iceberg	Methyl chloride
Icelet	Sulphur dioxide
Icemaster	Methyl chloride
Indian	Sulphur dioxide
Icyball (Crosley)	Ammonia
Jack Frost	Sulphur dioxide
Kelvinator	Sulphur dioxide
Keokuk	Sulphur dioxide
Kulair	Sulphur dioxide and Methyl chloride
Leonard	Sulphur dioxide
Lincoln	Sulphur dioxide
Mitycold	Methyl chloride
Majestic	Sulphur dioxide
Merchant & Evans	Sulphur dioxide
Mayflower	Sulphur dioxide
Napier	Methyl chloride
Niagara	Sulphur dioxide
Norge	Sulphur dioxide
O'Keefe & Merritt	Methyl chloride
Rice	Methyl chloride
Snowbird	Sulphur dioxide
Starr-Freeze	Sulphur dioxide
Sanitary	Sulphur dioxide
Servel	Methyl chloride
Trukold	Sulphur dioxide
Tricold	Sulphur dioxide
Chilledair	Methyl chloride
Universal Cooler	Sulphur dioxide and Methyl chloride
Westinghouse	Sulphur dioxide and Freon
Zerozone	Sulphur dioxide

42. Sulphur Dioxide

Sulphur dioxide is colorless as a liquid or vapor. It is produced by burning sulphur in air. Its chemical symbol is SO_2. The vapor from SO_2 has a very pungent sulphur odor.

The gases produced are given a special drying process to reduce moisture content to an absolute minimum, and then compressed and condensed under pressure into a liquid, and is handled commercially as such.

SO_2 is non-explosive and non-inflammable under all conditions. The boiling point of SO_2 under normal atmospheric pressures is +14° F., which by comparison, is desirably close to the evaporator temperature. The average operating back pressure (pressure on the low-pressure side of the system) is usually 0 lbs. gauge to 6 in. vacuum, resulting in an average refrigerant temperature of 10° F. This is given for comparison only.

SO_2 has a comparatively low condensing pressure and temperature. Under ordinary conditions, in a system having the correct size condenser and operating at normal back pressure, the head pressure (operating pressure on the high side of the system) should be far below the temperature of the cooling medium.

Due to the rapid crowding of heat laden SO_2 gas into the condenser, and to the fact that the temperature of the condenser must be in excess of the temperature of the cooling medium, before the heat will leave the gas, the actual operating head pressures with SO_2 are found to be higher than shown on the chart. (See Pressure-Temperature Chart shown in last issue.)

Under very favorable conditions the appropriate operating head pressure in an air-cooled system using SO_2 should be from 3 lbs. below the temperature of the cooling medium to 5 lbs. above the temperature of the cooling medium.

This is given for comparison and will be discussed later on in this series. The temperature of the cooling medium should always be taken right at the condensing coil, when determining the operating head pressure of the system.

While SO_2 vapor requires considerably more space than the liquid, the volume of vapor is sufficiently low to be desirous as a refrigerant.

The critical temperature of SO_2 is 315.0° F. Temperatures encountered under ordinary conditions are well below this point.

SO_2 has a sufficiently low ratio of compression so that compressors of standard design may be used.

SO_2 is a stable refrigerant and will not break down under ordinary conditions as its critical pressure is 1,141.5 lbs. absolute pressure.

SO_2 will not effect lubricating oils in its original dry state. SO_2 has an affinity for oil and will absorb from 10 to 15 per cent of its own weight in oil. The oil absorbed by the liquid SO_2 is circulated through the system with the refrigerant, and lends to the lubrication of the moving parts. It also acts as a seal between the pistons and cylinder walls, as well as the valves throughout the system.

SO_2 is considerably heavier than oil, and when an excess of oil is present with liquid SO_2, it will be found floating on top of the liquid, as cream floats on the top of milk. For ordinary temperatures encountered in the small refrigeration machines, the suggested viscosity of the oil should be between 75 and 150 at 100° F.

The oil should always be free from moisture and other foreign materials. Specially refined and dehydrated oils are supplied for this purpose.

SO_2 in its original dry state (containing less than 0.0030 per cent moisture) has no corrosive effect on the common metals used in the construction of the refrigeration system.

If an appreciable amount of moisture is allowed to unite with SO_2, it will form sulphurous acid. Sulphurous acid will attack ferrous metals. Moisture present in an SO_2 system will be noticed by a formation of a black gummy substance on the iron and steel parts of the system.

It may result in a carbon formation in the cylinder head. If sufficient amount of moisture is permitted to unite with the SO_2 in the system and the sulphurous acid solution becomes strong enough, the iron or steel parts of the compressor will seize and become tightly stuck together, rendering the system inoperative.

When moisture has entered the system and united with the SO_2, it is impractical to attempt to remove the moisture content. The entire system should be completely discharged of all the refrigerant and oil, thoroughly cleaned and dehydrated, and then reinstalled and recharged with dry SO_2 and dry oil. If extreme care is exercised in servicing an SO_2 system and the proper materials used, troubles from moisture will be reduced to a minimum.

A very simple but accurate field test to determine if moisture is present in liquid SO_2 may be made by the service man by placing a clean dry razor blade or similar piece of polished steel in a clean dry glass or flask.

Draw off a small amount of liquid SO_2 from the cylinder or from the system, filling the glass sufficiently to submerge the piece of steel. Place a clean dry cloth or cotton loosly over the opening of the glass, and allow the SO_2 to evaporate or boil off.

If the steel piece has not changed in appearance, that is, does not show any dark spots that were not present before the test, it is evident that the SO_2 does not contain moisture. If the piece of steel shows some dark spots or is discolored slightly the SO_2 may be said to contain too large a percentage of moisture.

The presence of SO_2 in the air is easily detected by allowing a strong ammonia fumes to escape near the SO_2. The reaction of the two chemicals will result in a white dense smoke.

To test the SO_2 system for leaks, hold a swab saturated with 26 per cent ammonia near the suspected leak and the white smoke will have its greatest density near the source of SO_2 supply, which will be the leak. The ammonia swab should not be allowed to touch the brass or copper of the system as it will cause them to corrode.

SO_2 is available in the following size cylinders: 5 lbs., 10 lbs., 25 lbs., 35 lbs., 70 lbs., and 150 lbs. Stocks are carried in all principal cities by refrigeration supply houses or chemical companies. The price of SO_2 per lb. ranges from 40 cents down to 14 cents, depending on the quantity purchased. Note: prices are for comparison only.

SO_2 vapor may be considered non-injurious to health for all practical purposes, but care should be exercised

(*Continued on Page 21, Column 1*)

SERVICE OPERATIONS

A SERIES OF LESSONS OUTLINED FOR THE USE OF THE SERVICE MANAGER IN INSTRUCTING BEGINNERS IN SERVICE WORK

Lesson No. 2—Evacuating Liquid Line, Suction Line, and Evaporator (Dry Expansion)

By K. M. Newcum

REASON:

Before removing the expansion valve, cleaning the strainer, repairing broken flares on either the liquid or suction line, removing or repairing the thermo coil, etc., it is necessary to remove the refrigerant from the lines and the evaporator. This is done in the following manner:

PROCEDURE:

A. Attach compound gauge to suction line shut-off valve on side of compressor and put into operation.

B. Close liquid line shut-off valve on receiver, all the way to the right, with the box wrench or ratchet wrench. (It is always advisable to loosen the packing gland nut about one-quarter of a turn before attempting to close valve.)

C. Remove rubber cap or brass plug from adjustment opening in the expansion valve.

D. Put compressor into operation.

E. Check operating back pressure. If below 0 lbs. gauge (SO_2 system) change adjustment to approximately 5 lbs. back pressure. This will prevent trapping liquid in the liquid line.

F. Watch the pressure on the compound gauge. It is always advisable to pump the pressure down to around 20 in. of vacuum. When pressure has reached 20 in. vacuum, stop the compressor. If gauge holds the vacuum, it is evident that all the refrigerant has been removed from the lines and the evaporator.

G. Crack (open slightly) the liquid line shut off valve at the receiver, allowing a small amount of liquid to enter the liquid line and evaporator to break the vacuum. Allow the pressure to build up to between 0 lb. and 1 lb. pressure. Close liquid line shut off valve. If pressure builds up past 1 lb., operate the compressor at short intervals to reduce pressure to 1 lb., then stop the compressor.

H. Crack the liquid line or suction line flare nut at the compressor, and if no gas escapes, the lines and evaporator are evacuated.

I. Check with instructor.

Note: Always return expansion valve to original setting when the system is put back into normal operation.

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INSTALLATION OPERATIONS

A SERIES OF LESSONS OUTLINED FOR THE USE OF THE SERVICE MANAGER IN INSTRUCTING BEGINNERS IN INSTALLATION WORK

Lesson No. 2—Making a Flare (Mechanical Method)

By K. M. Newcum

TOOLS NEEDED:

Tube cutter, mechanical flare block, and punch.

MATERIAL NEEDED:

Same as operation No. 1.

PROCEDURE:

1. Break off sealed end of tubing.
2. Hold tubing down so no cuttings will go into tubing.
3. Mark tubing where it is to be cut.
4. Install cutter over tubing, so that cutter wheel is over mark, and tighten with a slight pressure by turning the wing nut to the right or clock-wise.
5. Revolve tubing cutter tightening the wing nut slightly after each complete turn.
6. Continue revolving cutter and tighten until the tubing has been cut off.
7. Insert end of tubing cutter, which is made in the form of a reamer, and clean all the sharp edges off the inside of the tubing wall by revolving the cutter. Do not apply much pressure while reaming, as the copper tubing is soft.
8. Slip the flare nut in place on the tubing.
9. Install the flare block on the tubing, being certain to use the opening corresponding to the outside diameter of the tubing. Tighten the wing nuts on the flare block as tight as possible with the fingers. Leave 1/8 in. of tubing extend beyond the edge of the block.
10. Insert clamp type flare punch over flare block and tighten tee handle, moving the flaring face down into the end of the tubing. Apply a drop of compressor oil on the face of the punch. Continue tightening the tee handle until a perfect flare has been completed.
11. Remove punch and block and slip the flare nut over the flare.
12. Check with instructor.

Physical Properties & Characteristics of Common Refrigerants

(*Continued from Page 20, Column 5*)

in exposing persons, animals, pets, plants, etc. to the vapor. The very odor of SO_2 is a warning agent and able persons will remove themselves from its presence.

All invalids, pets, and plants should be removed from the room where any large amount of SO_2 vapor is present. Any person exposed to SO_2 to the point of becoming ill should be rushed to the open air, and a doctor should be consulted.

The service man should always wear, or have immediately available, a gas mask for use with SO_2, when an emergency makes it necessary for him to remain exposed to the vapor for any length of time.

Goggles should also be worn where there is any danger of the SO_2 getting into the eyes which might prove serious. If liquid SO_2 has been allowed to get into the eyes, they should immediately be flushed with water and a physician should be consulted.

43. Methyl Chloride

Methyl chloride is a chlorinated hydro-carbon. Its chemical symbol is CH_3Cl. At ordinary temperatures and pressure it is a colorless, sweet-smelling vapor. It is readily liquified and is handled and shipped as such.

Methyl chloride has a boiling point of approximately —11° F. at atmospheric pressure. For ordinary temperatures encountered, the operating back pressure of a system employing methyl chloride will average from 6 lbs. gauge to 11 lbs., resulting in an average refrigerant temperature of 10° F. This average is given for comparison for it can be seen that for ordinary temperatures, and by comparison to SO_2, the pressure on the low side of the system will be above 0 lbs. gauge while SO_2 is slightly below 0 in. gauge.

Methyl chloride has a low condensing pressure and temperature. Under the same generally favorable conditions as described under SO_2 and for comparison, the operating head pressure of a system using methyl chloride should be from 15 lbs. to 30 lbs. above the temperature of the cooling medium.

Methyl chloride has a relatively high latent heat and a comparatively low volume of vapor. The critical temperature of methyl chloride is 289° F. Methyl chloride has a low ratio of compression.

The critical pressure of methyl chloride is 970 lbs. absolute. Methyl chloride will not corrode metals generally used in the refrigeration system, even in the presence of moisture. However, the moisture content is reduced to a minimum in the manufacture of methyl chloride for its presence in the system will result in ice formations at the throttle valve needle and seat, which will stop the flow of refrigerant into the evaporator.

Methyl chloride will not mix with water and does not hydrolyze with water, hence it does not form any corrosive solutions. Any water or moisture that may have found its way into the methyl chloride system may be successfully removed by the use of a dehydrator, which employs a dehydrating agent and is placed in the liquid line.

Any moisture or water being carried with the refrigerant and oil will be absorbed by the dehydrating agent, which later may be removed from the system, leaving the refrigerant free from moisture.

Mineral oils are miscible with methyl chloride in all proportions. At ordinary compressor temperature and pressure the methyl chloride does not sufficiently dilute the oil to materially reduce its lubricating efficiency.

The viscosity of the oil is lowered when diluted with methyl chloride, and for that reason a heavier oil is used. A suggested viscosity is 150 to 300 at 100° F.

The oil and methyl chloride solution is carried to the evaporator, and it has been found that the solutions boil at temperatures only slightly higher than pure methyl chloride, and to have but little effect on the refrigerant temperature.

Methyl chloride is known to be flammable and explosive under certain conditions. Mixtures of methyl chloride vapor in air are explosive only when the concentration by volume of methyl chloride is between 8.1 per cent and 17.2 per cent.

The possibilities of an explosion with methyl chloride are very remote, even in the event of a serious leak in the system. The average kitchen has an air capacity of about 1,000 cu. ft., and the usual household refrigerator has around 3 lbs. of methyl chloride.

If the entire charge were released from the equipment at one time, and there were no ventilation in the room, the concentration of methyl in the air would be only 2.5 per cent by volume, which is well below the lowest limit, or 8.1 per cent required for an explosive mixture.

Methyl chloride is considered a moderately flammable refrigerant and constitutes a relatively low fire hazard. The apparent ignition temperature has been found to be 1,169.5° F. This temperature is considerably higher than ordinary temperatures encountered in ordinary refrigeration operation.

If the valve on cylinder of methyl chloride is opened slightly, the escaping vapors can be lighted but if the valve is opened slightly more the pressure will blow the flame out, and it will be difficult to keep the flame lighted.

The effect of breathing methyl chloride vapor upon the human being may be described as being similar to alcohol intoxication. Relatively large concentrations and long exposure is necessary to produce illness from the effect of breathing methyl chloride.

Persons that have been subjected to the vapor for any length of time, or until they become ill from its effects, should be removed from the exposure, and allowed to breath pure air freely.

From tests on blood and tissues it appears that methyl chloride is quickly eliminated from the patient after being removed to the open air.

Flowers and plants are not seriously effected by being exposed to methyl chloride. The vapor from methyl chloride seems to have little effect upon the eyes, but liquid methyl chloride should not be allowed to get in the eyes for it will boil and have a tendency to freeze the tissues. Goggles should be worn to prevent this danger.

Leaks in a methyl chloride system may be located by applying a film of soap suds over the joints and connections. With pressure inside the system, any leak will result in bubbles forming in the soap suds. A film of oil may also be applied over the connections with the same result.

A special blow torch known as a Halide-Lamp, or Halide leak detector, having a specially constructed burner housing, may be used to locate methyl chloride leaks.

This leak detector should be partially filled with alcohol and lighted. The flame should be played around the part of the system suspected of leaking. A distinct blue-green flame indicates the presence of organic halides. If no organic halides are present, the lamp burns with an ordinary pale blue flame. This test is sensitive to one part in 100,000. This test should not be used where large quantities of gas may be present.

Methyl chloride is available in the following size cylinders: 3 lbs., 6 lbs., 15 lbs., 40 lbs., 60 lbs., 90 lbs., and 130 lbs. Stocks are carried by refrigeration supply houses or chemical companies in most cities. The price of methyl chloride is slightly higher than SO_2, as its average price ranges from 88 cents per lb. down to 48 cents.

44. Ethyl Chloride

Ethyl chloride is similar in many respects to methyl chloride as it is a member of the same chemical family. It is composed of carbon, hydrogen, and chlorine, and its chemical symbol is C_2H_5Cl. The gases are compressed into a liquid and handled as such in cylinders.

It has a boiling point of 55.6° F. at atmospheric pressure.

With this comparatively high boiling point the pressure at which it may be compressed is very low. Pressures of from 10 lbs. to 40 lbs. on the condenser while the machine is in operation are not uncommon.

The operating back pressure is also correspondingly low. To obtain a 10° F. refrigerant in the evaporator, the evaporating back pressure will be from 17 in. to 20 in. vacuum.

Due to the low pressure of ethyl chloride, machines and evaporators of very light construction may be employed.

The refrigerating effect per unit volume is low, so that the compressor cylinders must be considerably larger than those used with SO_2 and methyl chloride. Ethyl chloride is more commonly used in the rotary type compressor.

Ethyl chloride is a neutral refrigerant and has no action on the common metals used in the construction of the system. Water does not mix with ethyl chloride to form corrosive solutions, but the same general care should be used to exclude moisture from the system as with SO_2 and methyl chloride. Moisture may be removed with the dehydrator as in methyl chloride.

The critical temperature of ethyl chloride is 360° F. and the critical pressure is 784 lbs. absolute pressure. At temperatures and pressures below these, the refrigerant retains its chemical bond and may be compressed and evaporated over and over again.

The use of ethyl chloride presents a similar condition with the lubricating oils and leak detection as does methyl chloride, and has about the same explosive and flammability characteristics as the latter.

Ethyl chloride is usually charged into 100-lb. cylinders for shipping and

(*Concluded on Page 22, Column 3*)

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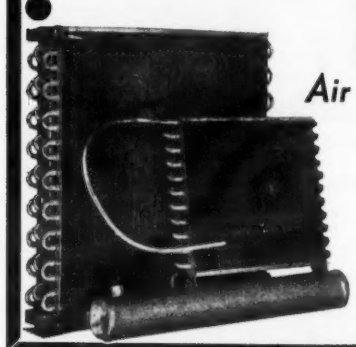

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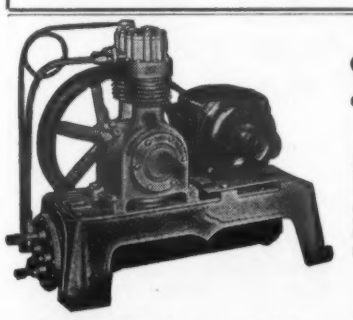

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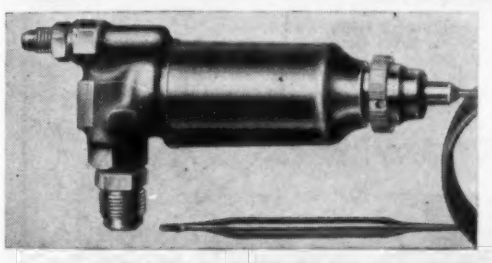

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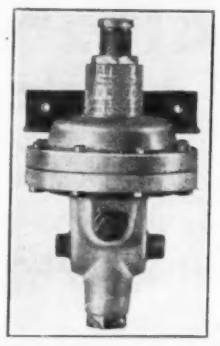

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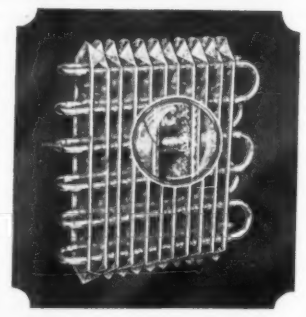

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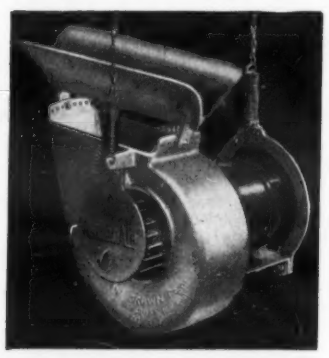

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Physical Properties & Characteristics of Common Refrigerants

(*Concluded from Page 21, Column 3*)

handling. Smaller cylinders may be refilled from the larger cylinders for service work. The average cost per lb. is from 30 to 75 cents.

45. Ammonia

Ammonia is a chemical compound of nitrogen and hydrogen. Its chemical symbol is NH_3 and under ordinary temperature and pressure conditions is a colorless gas.

Ammonia, like the other refrigerants, is compressed into a liquid and handled commercial as such. Ammonia is somewhat flammable and with the proper mixture of air will form an explosive mixture. Accidents from this source are considered very rare.

Ammonia gas may be classed as non-poisonous, but its effect on the respiratory system is very violent and only small quantities may be breathed at a time. Service men should always wear a gas mask when exposed to ammonia fumes.

Due to the very pronounced and distinguishable odor of ammonia, leaks are readily detectable and persons warned of its presence in the air.

To locate an ammonia leak is the reverse of locating a sulphur dioxide leak, that is, to present sulphur fumes in the presence of ammonia fumes and the dense white smoke will result.

Ammonia has a very high latent, it being 565 B.t.u.'s at 5° F., and a relatively large amount of refrigeration may be effected with correspondingly small machinery.

The boiling point of ammonia at atmospheric pressure is −28° F. Low temperatures may be obtained without going into a vacuum on the low side of the system. The average back pressure to obtain a 10° F. refrigerant temperature would be 19 lbs. to 28 lbs. pressure.

Under ordinary conditions the operating head pressure on an ammonia system will range from 150 lbs. to 200 lbs. At temperatures below 300° F., ammonia is considered a stable refrigerant but it is known to break down into foul, noncondensable gasses at ordinary operating temperatures encountered. This foul gas may be purged off at the topmost part of the condenser.

Anhydrous ammonia will not attack copper or its alloys but since there is a constant danger of moisture finding its way into the system which when united with the ammonia will attack copper, brass, and bronze, only iron and steel is used in the construction of an ammonia system. Ammonia will very readily absorb water forming ammonium hydroxide, or aqual ammonia. This feature makes ammonia very desirable for use in the absorption system.

Ammonia presents no special lubrication problems. It is obtainable in the following size cylinders: 50 lbs.; 100 lbs.; and 150 lbs. and is carried in stock in many of the large cities. The price per lb. is from 17 to 23 cents.

46. Freon

Freon, sometimes known as F-12, is dichlorodifluoromethane. The chemical symbol is FF_2F_2. It is a colorless and almost odorless gas. The liquid has a boiling point of −21.7° F. at normal atmospheric pressure.

Freon is generally prepared by replacing chlorine in carbon tetrachloride with fluorine. It is chemically inert at ordinary temperatures and thermally stable up to 1,022° F. Like all the other refrigerants, Freon is compressed into a liquid and handled for shipment as such.

Freon is non-toxic, non-irritating, and non-inflammable.

The average operating back pressure in a system using Freon, and as compared with other refrigerants, is from 13 lbs. to 16 lbs. pressure, to result in an average refrigerant temperature of 10° F.

Freon has a slightly higher operating head pressure than SO_2 and methyl chloride, averaging somewhere between 90 lbs. and 135 lbs. with normal cooling medium temperatures. The operating head temperatures or compression temperatures are considerably lower than the other refrigerants.

Freon has a comparatively low latent heat value, which means that slightly more Freon would have to be circulated to produce the same amount of refrigeration as for example, methyl chloride or SO_2.

Freon is approximately three times as dense as methyl chloride, and approximately four times as dense as SO_2. Due to this density, all lines, valves, and gas or liquid passages should be larger to prevent restrictions, and to obtain maximum operating efficiency.

Freon is miscible with mineral oils in all proportions, that is, the liquid and the oils mix very freely. The solution is found to vaporize very readily, and at a temperature only slightly higher than pure Freon in the evaporators. Oil logging or separation of the oil from the refrigerant in the evaporator is considered slight if at all.

Due to the mixing of the oil and the refrigerant, oils of higher viscosity are recommended. The suggested viscosity is from 150 to 300. Oils used with Freon must be free from foreign materials and completely dry. Most of the oil companies are now in a position to supply oils suitable for use with Freon.

Freon is only slightly soluble in water, and the solution formed will not corrode any of the common metals used in the construction of refrigeration systems. Moisture should be kept out of the system, as it will form ice at the throttle valve, and restrict or stop the flow of liquid into the evaporator.

Moisture may be removed from a Freon system by using a dehydrator in the liquid line, charged with one of the common chemical dehydrating agents. Some manufacturers have followed the policy of adding a very small amount of anhydrous methyl alcohol to the system to prevent freezing of the moisture at the throttle valve.

Freon leaks may be detected with the Halide leak detector, and the presence of Freon will cause the flame to burn a blue green color.

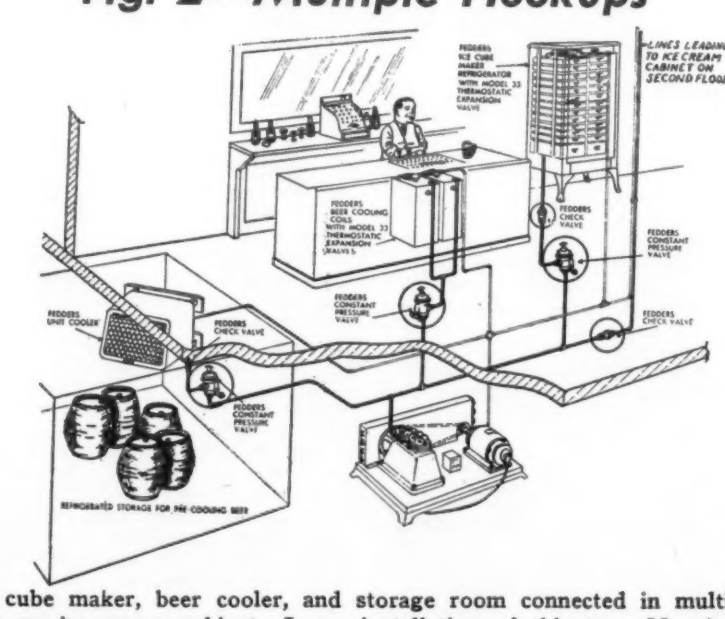
As Freon is considered non-toxic, it is not necessary to wear a gas mask when working around the vapor. It is considered important to wear goggles to prevent liquid Freon from getting in the eyes.

Should liquid Freon come in contact with the skin, the injury should be treated the same as if the skin was frost bitten. Should liquid Freon get into the eyes, drops of sterile mineral oil should be introduced into the eyes, then the eyes should be washed with pure water.

If any irritation continues, the eyes should then be washed with a weak solution of boric acid. In any case where any large amount of liquid has reached the eyes the patient should be taken to any eye specialist.

Freon is not available on the open market like the more common refrigerants, but is distributed by manufacturers using Freon in their refrigerating systems.

Fig. 2—Multiple Hookups


FEDDERS ICE CUBE MAKER REFRIGERATOR WITH MODEL 33 THERMOSTATIC EXPANSION VALVE
LINES LEADING TO ICE CREAM CABINET ON SECOND FLOOR
FEDDERS BEER COOLING COILS WITH MODEL 33 THERMOSTATIC EXPANSION VALVE
FEDDERS CHECK VALVE
FEDDERS CONSTANT PRESSURE VALVE
FEDDERS UNIT COOLER
FEDDERS CHECK VALVE
FEDDERS CONSTANT PRESSURE VALVE
FEDDERS CHECK VALVE
REFRIGERATED STORAGE FOR PRE-COOLING BEER

Ice cube maker, beer cooler, and storage room connected in multiple with an ice cream cabinet. In an installation of this type Mr. Askin recommends the use of a two-temperature snap-action valve in the suction line from the ice cube maker, instead of the constant pressure valve as shown in the above drawing of the multiple installation.

Askin Explains Proper Use Of Two-Temperature Snap Action Valve

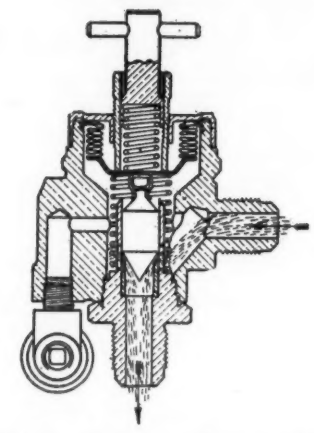
BUFFALO—The distinction between a two-temperature snap-action valve and a constant pressure valve in application has been explained by Joe Askin, chief engineer of the Fedders Mfg. Co., in a recent bulletin issued by that company.

Mr. Askin's explanation follows:

Figure 1 shows a constant pressure valve in an open position.

It will be observed that the opening between the needle and the seat is slight, that is, restricted or throttled.

Figure 1



Constant pressure valve in open position, showing small opening.

Once the valve is set for a definite pressure in the evaporator the pressure setting will remain constant, *provided an excessive load does not come on the evaporator suddenly.*

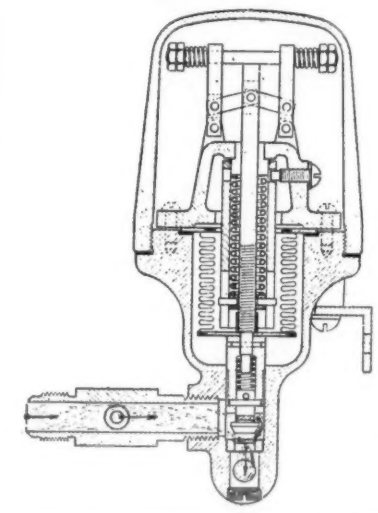
If an excessive load should come on, the constant pressure valve will respond, but it will build up a back pressure until this excess load recedes. An example will clarify this.

Figure 2 shows an ice cube maker, beer cooler, and cold storage room hooked in multiple with an ice cream cabinet, and constant pressure valves used in all suction lines. (CH_3Cl used.)

Setting of the constant pressure valve on the suction line of the ice cube maker coils is 5 lbs.

Suppose that the owner should need a large number of ice cubes and should change all the trays at the same time, placing warm water in the trays. Immediately the coil floods with liquid refrigerant (due to the thermostatic expansion valve responding to this increase in load).

Figure 3



Two-temperature snap-action valve in the open position.

The back pressure goes up from 5 lbs., to let us say, 10 lbs. It does not immediately return to 5 lbs. due to the fact that as the refrigerant gas is flowing past the needle valve a back pressure is set up which remains for a considerable length of time until the load again becomes normal.

Of course this higher back pressure has a tendency to slow up the freezing time of the fresh batch of water due to a higher refrigerant temperature.

What would a two-temperature snap-action valve do under like circumstances?

Cut out and cut in pressures of the two-temperature snap-action valve are 2 in. of vacuum and 11 lbs. in the ice cube maker suction line.

When the warm trays of water are placed in the ice cube maker all at one time the coils flood with liquid refrigerant (due to the model 33 thermostatic expansion valve responding to this increase in load).

The pressure goes up and the snap-action valve immediately opens up wide, allowing the gas to go to the suction side of the compressor with little or no pressure drop due to the free and clear opening of the needle. (Fig. 3 shows the two-temperature snap-action valve in the open position.)

For such an application the two-temperature snap-action valve should be used in preference to the constant pressure valve.

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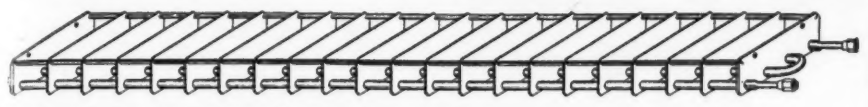

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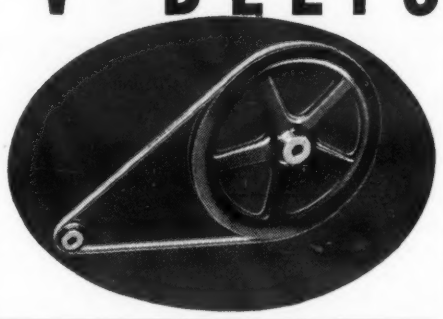

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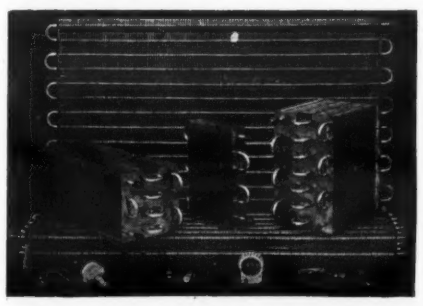

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QUESTIONS

Cooling Room Doors

No. 2191 (Service company, New York)—"Please send us names of manufacturers of cooling room doors suitable for use in meat coolers and refrigerated dairy rooms.

"We are interested in doors of various sizes and specifications for built-to-order refrigerated rooms."

Answer: Manufacturers of cooling room doors are listed on pages 182 and 183 of the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

F & H Mfg. Co.

No. 2192 (Manufacturer, Illinois)—"Kindly refer to writeup in March 27, 1935, issue of ELECTRIC REFRIGERATION NEWS covering the F & H Mfg. Co. We wrote them addressed to Detroit, Mich., and the envelope was returned by the Detroit post office "unclaimed.' Kindly advise street address, and it will be perfectly satisfactory to write same on this letter."

Answer: Address of the F & H Mfg. Co. is 4234 Mt. Elliott St., Detroit, Mich.

Water Cooler Cabinets

No. 2193 (Water company, Massachusetts)—"We would like to get the names and addresses of the various manufacturers of cabinets for electric water coolers, especially whoever manufactured cabinets for the National Electric Refrigeration Co. coolers."

Answer: Manufacturers of cabinets for electric water coolers are listed on pages 215 and 216 of the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

The National Electric Refrigeration Corp. of Scranton, Pa., which manufactured the Nerco water cooler, went out of business in 1932, and we have no record of who manufactured the cabinets for their water coolers.

Sales for Jan. & Feb.

No. 2194 (Consulting economist, Illinois)—"Will you kindly let us know if you have any data with regard to sales of electric refrigerators throughout the country for the first month or first two months of this year?"

Answer: We have estimated that approximately 103,500 household electric refrigerators were sold by manufacturers to distributors and dealers throughout the world during January, 1935.

Industry manufacturers sold an estimated 128,300 household electric refrigerators to distributors and dealers during February, 1935.

Beer Cooling Accessories

No. 2195 (Distributor, Iowa)—"We are anxious to contact manufacturers who have fittings and beer dispensing equipment, such as beer taps, bungs, gas pressure regulators, rubber beer tubing, beer fittings, spigots, faucets, etc."

Answer: Names and addresses of manufacturers of fittings and beer dispensing equipment are contained in the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY as follows:

Beer coolers, page 167; beer taps, page 170; gas regulators, page 171; fittings, page 294; beer hose, page 171.

Apex Door Stop

No. 2196 (Distributor, Indiana)—"We have noticed that the Apex refrigerator uses a small rubber device which fastens to the hinge on their refrigerator door which prevents the door swinging back too far and striking any object.

"We wonder if you could advise us the manufacturer's name making such a device as we are interested in securing a stop of this nature to fasten to the hinges of Crosley and Electrolux refrigerators as we are distributors for both of these boxes."

Answer: We do not know who manufactures the rubber door stop used on the Apex refrigerator. However, we suggest that you communicate with Rex Mfg. Co., Connersville, Ind., as this company makes the Apex cabinet and should be able to give you the information which you desire.

English Address

No. 2197 (Manufacturer, New York)—"Could you by any chance give me the complete London address of A. J. Balcombe, Ltd., of England."

Answer: We cannot find a record of the complete address of A. J. Balcombe, Ltd., of London, England. We suggest that you might be able to obtain the address of this company from Melchior, Armstrong, Dessau Co., 300 Fourth Ave., New York City.

Majestic Parts

No. 2198 (Distributor, Pennsylvania)—"Please inform us as to the name of the company now handling Majestic refrigeration parts and units. It seems we misplaced your issue giving this information."

Answer: Majestic parts and units can be obtained by addressing Frank M. McKey, Trustee, Grigsby-Grunow Co., Inc., 5801 Dickens Ave., Chicago, Ill.

Revolving Display

No. 2199 (Distributor, Connecticut)—"Do you know where I could get a revolving display for use in a window, capable of supporting the weight of a refrigerator?

"There are such displays made, but we have been unable to locate any in the East. I believe they are run by a small fractional horsepower motor, but they must be adequately built to carry the weight of a refrigerator, which, I assume, would necessitate a ball bearing support, or at least a very hard wood base with a ball race for the base to run on.

"I have a request from one of my dealers, and we would also like to obtain one of these for general show purposes.

"If you know of such an item, I would appreciate any information you could give me."

Answer: Try Electric Window Salesman Co., 22 Nashua St., Woburn, Mass., and Motion Displays, Inc., 29 Ryerson St., Brooklyn, N. Y. These companies manufacture electrically driven window display tables.

Refrigeration Machines

No. 2200 (Manufacturer, Illinois)—"Please send us a list of manufacturers of small refrigeration machines and also their distributors. If there are any charges attached to this, please advise us by return mail."

Answer: Manufacturers of household condensing units are listed starting on page 249 of the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

We are unable to furnish you with a list of distributors representing these manufacturers.

Ice Cream Sandwich Maker

No. 2201 (Dealer, Florida)—"Kindly advise what companies, if any, make an ice cream sandwich machine.

"Who makes the 'Sinacco' ice cream sandwich machine?"

Answer: Manufacturers of ice cream sandwich machines are as follows:
Akron Equipment Co., Akron, Ohio.
The Northwestern Corp., Morris, Ill.
The W & S Universal Ice Cream Cutting Machine Co.
10908 Hathaway Ave., Cleveland, Ohio.
Sanisco Co.
2651 N. Third St., Milwaukee, Wis.

We can find no record of the trade name "Sinacco" in connection with ice cream sandwich machines, and believe that you may have in mind the Sanisco Co. mentioned above.

New England Sales

No. 2202—(Dealer, Connecticut)—"Please wire collect New England electric refrigerator sales for 1926 to 1934 inclusive using total for six states."

Answer: New England sales by members of Refrigeration Division, National Electrical Manufacturers Association for 1932: 54,156; 1933: 72,264; 1934: 79,431. Figures for previous years not available.

Rubber Door Gaskets

No. 2203—(Finance company, Quebec, Canada)—"Would it be possible for you to let us know where we could get, in the states, gaskets for refrigerator doors, meaning rubber gaskets which we put on doors on electric refrigerators?"

Answer: Manufacturers of gaskets for refrigerator doors are listed starting on page 229 of the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

Retail Prices

No. 2204 (Distributor, New York)—"Kindly send us complete consumer price on G. E., Westinghouse, Gibson, Kelvinator, Leonard, and Hot Point electric refrigerators.

Answer: List price of most of the leading makes of household electric refrigerators were included with the specifications of these refrigerators published in the March 20 issue of ELECTRIC REFRIGERATION NEWS. Hot Point specifications were published in the April 10 issue.

In case you don't have these issues in your file, back issues may be obtained at a cost of 10 cents each by addressing Business News Publishing Co., 5229 Cass Ave., Detroit, Mich.

Rex Mfg. Co.

No 2205 (Dealer, Georgia)—"Could you advise us the name of the manufacturer who produces Rex household refrigerator cabinets. These people were extremely advertised some years ago."

Answer: Rex household refrigerator cabinets are manufactured by Rex Mfg. Co., Connersville, Ind.

A complete list of manufacturers of cabinets for household refrigeration is included in the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

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PATENTS

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Coils & Compressors

No. 2206 (Dealer, California)—"Please give us the names of manufacturers of coils and pressure pump but not motor for electric refrigeration. Also ditto for kerosene-operated refrigerators."

Answer: Manufacturers of cooling coils for household electric refrigerators are listed starting on page 252 of the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY; manufacturers of compressors starting on page 251 of the DIRECTORY; and manufacturers of kerosene-burning refrigerators starting on page 248.

Biological Inserts

No. 2207 (Association, Illinois)—"We have an inquiry today asking us to find out who is building biological cabinets for the interior of refrigerators.

"Our inquirer says these cabinets are used for the storage of biological serums and they understand that both Frigidaire and Electrolux have used them.

"Would it be possible for you to give us any information on this?"

Answer: Bacteriological inserts for refrigerators used in hospitals are manufactured by the Stewart Sheet Metal Works, 6001 Lawton St., Detroit, Mich.

Water Cooler Prices

No. 2208 (Exporter, New York)—"As subscribers to your valuable paper, we wonder whether you can send us a statement of the installed prices of General Electric water coolers?"

Answer: Installed prices (Detroit) for General Electric water coolers are as follows: Model DB-1: $145; BB-1: $201; BM-21: $201; PB-1: $201; RM-21: $216; RM-51: $215; PB-3: $237; RM-61: $252; RM-71: $289.

Glass Trays

No. 2209 (Manufacturer, Ontario, Canada)—"Will you please give us the address of a source of supply for glass trays for refrigerator use. We have written several of the glass manufacturers in the U.S.A. but so far have not been able to make contact with a stock source."

Answer: Manufacturers of refrigerator trays and dishes are listed starting on page 254 of the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

Compact Kitchens

"In your March 13 issue under 'Questions' we have noted Question No. 2114, with reference to compact kitchens.

"In your answer, you have not included the built-in kitchen units as manufactured by our company."—Colonial Stove Co., Philadelphia, Pa.